DENTISTRY IN ANCIENT INDIA



BY

K. M. CHOKSEY

Zeug. D. S. (Vienna)

WITH A FOREWORD

BY

DR. N. N. BERY

SOLE AGENT

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To

Dr. R. AHMED D. D. S., F. I. C. D., F. S. M. F.,
F. D. S. R. C. S. (Eng.)

The grand old man of dentistry in India. The Ex Principal, and founder of the Calcutta Dental College and Hospital, now Minister, West Bengal.

In grateful recognition of his life-long noble services to the cause of dental education and journalism in India, this book is respectfully and affectionately dedicated.

K. M. Choksey

PREFACE

The subject of dentistry in ancient India has attracted the attention of two eminent fellow workers prior to this book. The illuminating papers of Dr. N. N. Bery of New Delhi and the late Dr. J. J. Modi of Bombay were published in 1929 and 1931 respectively in the Indian Dental Journal. Inspite of the brilliant and strenuous efforts of the writers their work was unfortunately relegated to undeserved oblivion except a few lines of Dr. Modi's paper which survive in the book of Mrs. Lilian Lindsay.

The interesting and instructive work of these two writers has intensely stimulated my curiosity to ransack the vast stores of knowledge for further materials regarding dentistry in ancient India that could be placed before the devotees of this science. Thus it is my humble effort to facilitate the work of dental scholars, to supply them with more facts and to present the subject in the right perspective so that dentistry in ancient India may be properly understood and appreciated, and may receive its due recognition at the hands of the scholars. It is a matter of great regret that the origin and development of the science of dentistry in the ancient world has failed to receive adequate attention at the hands of some of the western dental historians.

This treatise is not a lenghty dissertation on our ancient dental science, but aims to present to the professional brothers certain aspects of truth and knowledge, which may perhaps appear imperfect to others. The ultimate object of this work is to inspire enthusiasm in the minds of industrious scholars for the precious treasures

of knowledge lying hidden in the works of those pioneers of medicine. There is a vast field of research awaiting the labours of enthusiastic workers. I presume some future chronicler will bring out a more comprehensive volume on the subject.

The glorious achievements of Sushruta as surgeon and Charaka as physician have revealed many interesting and novel lines of treatment for the diseases of the mouth. As regards Charka's work, I would like to express my deep gratitude to Dr. P. M. Mehta, the great Ayurvedic scholar and the Dean of the Ayurvedic Medical College of Jamnagar, for his unfailing and ready help rendered to me on the subject. I am equally indebted to my esteemed colleague Dr. N. N. Bery of New Delhi, for his wise counsel and inspiring advice during all these years without which this book would not have seen the light; sincere thanks are also due to him for writing the foreword of this book. It would not be out of place to mention my gratitude to Dr. S. K. Mazumdar of Calcutta and Dr. U. S. Malik of New Delhi for their sympathetic encouragement of this work. I am also obliged to my friend Dr. P. P. Sheth, honorary surgeon at the B. J. Medical College, Ahmedabad for going through the typescript and making valuable suggestions and also to Dr. C. H. Naik, the consulting physician of the Ahmedabad Civil Hospital for correcting the script. My Special thanks are due to Dr. K. D Jila of Navsari for lending me the blocks of the instruments.

If my brief work succeeds in creating interest among the colleagues. I shall consider my efforts to be amply rewarded.

Richey Road,
Ahmedabad (India)

K. M. Choksey

FOREWORD

The translation of the Great works of "Sushruta" and "Charaka" specially pertaining to Dentistry in Ancient India, is a noteworthy achievement and I must congratulate young Choksey for his diligence and perseverance during the last three years. The Sanskrit of the Vedas is difficult, deep and exciting, but not intelligible to the modern world unless translated into a modern language. Much research has been done on the "Ayurveda", and Government have sponsored many projects to unearth the secrets and value of indigenous medicine handed down to posterity, with good results Many of these drugs have been found to be cheap and efficacious and modern medical science has adopted them unknown of their former use, under different forms and combinations for treament. Recent investigation by the Chopra Committee have proved the value of many such drugs beyond scientific doubt. Much has yet to be done to sift the chaff from the wheat, which necessarily accumulates when science lies hidden for centuries.

To the Dental Historians like Weinberger, Bremner and Lindsay this work should prove of inestimable value and in their revised editions of the History of Dentistry, I am sure Ancient India will receive more than a passing reference. The accuracy of this account can be verified from the great historical works of the Ayurveda–copies of which are available at the Bodelain Library, Oxford (England) and the Congressional Library, Washington D. C. (U. S. A.). I am happy that my initial effort in 1929,

writing a thesis on "Dentistry in Ancient India" for my degree at Pennsylvannia (U. S. A.) under the guidance of Professor Hermann Prinz, has kindled the spark in the younger generation to dig out the past and bring glory to India in the future Annals of Dentistry.

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(India).

N. N. BERY
F. D. S. R. C. S., D. D. S., F. I. C. D.

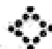


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Dentistry in Ancient India.

Chapter I

THE ORIGIN OF DENTISTRY

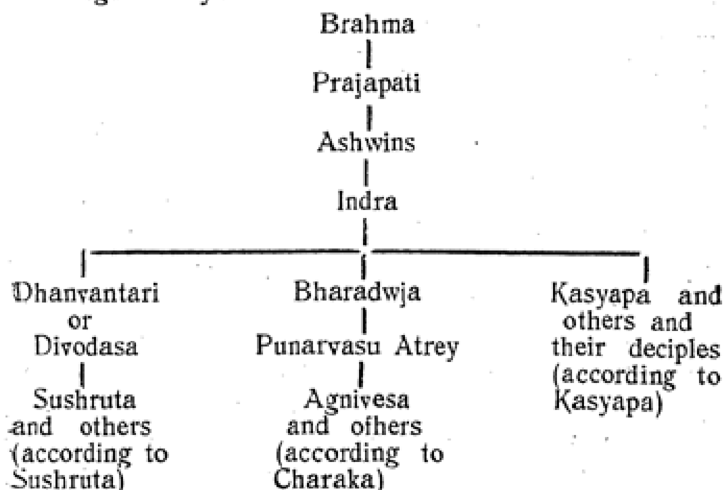
Dentistry is as old as medicine in civilised countries. The systematised knowledge of preserving the natural teeth in a healthy state was known to the ancient seers. Dentistry in ancient India was a part and parcel of the science of medicine and the healing art. It was not an autonomous and independent profession in those old days, as it is to day. It was practised by the Ayurvedic doctors. There were specialists for different diseases of the body, but there was no specialization in dentistry. The surgeons were called Salya Vaidya, the physicians were known as Bhishakas, magic doctors were Bhishag Atharvan, Kritya Haras were demon doctors, poison curers were named as Vish–haras. But there is no word in Sanskrit equivalent to the word dentist. In order to trace the antiquity of Indian dentistry one has to search through the history of Indian medicine, since as stated above, it wás an intregal part of the medical science.

Ayurveda is the ancient medical science of the Hindus. The word "Ayurveda" means the science of life. It is believed to be a sacred science of divine origin. It was first practised by gods. The various verses relating to medicine lie scattered throughout the Vedic poems. The

part of the Vedas which deals with medicine is known as Ayurveda. The self-existent Brahma was the first god to establish the principles and practice of Ayurveda. It was originally composed of 1,00,000 stanzas divided into 1,000 chapters. But considering the short span of human life in this world and frail human memory, he divided the whole science into eight different subjects: (1) The Salya Tantra is the science of surgery. (2) The Salakya Tantra deals with the treatment of the cavities in the upper part of the body like eyes, ear, nose, mouth, and other parts. (3) Kaya Chikitsa is the treatment of internal medicine. (4) Bhuta Vidya or demonology is for the treatment of the evil effects of demons on the body, and for curing the malignant influence of the devils, ghosts, and other spirits (5) Kaumar Britya or pædiatrics specially deals with mother's milk in connection with diseases of the children. (6) Agada Tantra is in regard to the treatment of the toxic effects of bites of snakes, of poisonous worms, of scorpion bites, rats, and other insects. (7) Rasayan Tantra is the treatment of rejuvenation and longevity. (8) The Vajek Tantra deals with means of stimulating sexual power.

Brahma taught this sacred science to Prajapati and by Prajapati it was imparted to the Ashwins, the twin sons of the Sun. They gave new teeth to Pushan. This is the earliest mention of dentistry in Hindu literature. It dates back to a remote past of hoary antiquity. The Ashwins imparted this holy knowledge to Indra, who handed down this science of life to Dhanvantari, and he bestowed this valuable knowledge and light of truth on

the talented Sushruta. He represented the surgical school while the great Charaka belonged to the school of medicine. The following table from Charaka Samhita shows the origin of Ayurveda.:—



Dhanvantari is the name of the physician of gods in heaven. He was born in this world as Divodasa, the king of Benares (Kasi) surnamed Dhanvantari. In Sushruta Samhita he is referred to as a teacher of Salya Tantra or major surgery. He said "It was I who cured the diseases of gods and guarded their deaths and decreptitude. I have now come to this world to teach Salya Tantra and other branches of knwledge of the Ayurveda in details". The following story from G. N. Mukhopadhyaya is quoted in support of the above statement:- I.

"Once upon a time Sushruta and other sages approached Lord Divodasa the king of Benares, surnamed

Dhanvantari, when he was sitting in the company of the sages at his Himalayan retreat. They said "O Lord different types of pain arise from physical, mental, and natural or accidental calamities. It causes distress to our mind when we see the pathetic conditions of those diseased persons who are helpless. We are eager to learn the everlasting truth of Ayurveda from you, in order to cure diseases of suffering humanity, to protect and preserve their health and also to confer its benefits on the animal world. Be pleased Sire, to teach us the truth of this valuable science, for upon it depends our welfare and happiness in this world and the next. We have approached you, therefore as disciples to learn the science of life."

Dhanvantari after hearing the above petition of the sages replied "It is indeed a joy to meet you here. O my dear students, you are well versed in many sciences and therefore are competent persons to receive the knowledge of Ayurveda. I shall teach it to you. It is the science of Ayurveda which is divided into eight branches.

Now what shall I teach and to whom." Thereupon the sages replied. "Oh Lord, please teach us the Salya Tantra or the science of surgery with the necessary commentary on it". He said " Be it so ". Now they further said, "we agree with your opinion and Sushruta will on our behalf set forth our difficulties and doubts, while learning this science we shall hear your words attentively." He again said " Be it so, my dear Sushruta, knowledge of Ayurveda is indispensable in this world to cure the diseases of the sick and to preserve the health of the people.

By the knowledge of this science, we can prolong our life or know its secrets.

I will teach you the science of surgery with the help of theories and analogy. Be attentive. According to the rules of this science ulcers heal and wounds close up. In the days of yore, the separated head of Daksha was made one with his holy body by its use. Of all the branches of the healing art, the science of surgery is the most useful, for by its help we can realise our objects soon, and further, it treats of the practical way by which the surgical instruments may be used along with caustic and cautery. By its practice we may acquire fame and welfare here, and obtain heaven after death. I learnt this science from Indra. Now I will lecture on it for the good of those who are disposed to take advantage of it."

There is also another mythological version of the birth of Dhanvantari. It is this that he rose from the ocean when it was churned by Devas and Asuras with a view to obtaining Amrita (immortality) or nectar.

" Then seated on a lotus,
Beauty's bright goddess Sri arose,
Out of the waves, and with her robed in white
Came forth Dhanvantari, the god's physician
High in his hand, he bore the cup of nectar
Life giving draught, longed for by gods and demons
Then had the demons forcibly borne off
The cup and drained the precious beverage
Had not the mighty Vishnu interposed.
Bewildering then, he gave it to the gods.

> Where at, incensed the demon troops assailed
> The host of heaven, but they with strength renewed
> Quaffing the draught, struck down their foes who fell
> Headlong through space to the lowest depth of hell"

(Dowson's mythology P. 13)

It will be thus seen, that it is very difficult to trace the regular choronology of history of Indian medicine, for the date and age in which the great masters of medicine lived, are shrouded in the mists of mythology. Even celebrated historians have not been able to throw light on the history of the pre-Buddhistic period. In India the theory of illusionism prevails and therefore the lives of the kings, the sages or the common people are not considered worthy of historical record. India had little sense of history and so the lives of the learned sages are mixed up with national mythology in a poetic style, concerned only with teachings of the doctrines of their schools. There is no authoritative account of the historical events of the saints, seers, or the kings whose names are found in ancient Sanskrit literature.

The ancient inscriptions, paintings, instruments, and medical literature in India and in the neighbouring countries should be carefully scrutinised in order to ascertain historical facts. Luckily a large amount of medical literature is still in existence for this purpose. The information which is available to day is from the sacred writings of the Vedas. Prof. Castiglioni of Italy refers to " The sparse information we have about the lives of the famous medical writers, together with a general legendary

atmosphere". 2. He further states " The historical indications then, one takes account of the valuable studies that exist in this field are vague and for the most part insecure. And this is because the Indian historiography in general is so involved with legend, that it is extremely difficult to extract the true facts from the available texts. " 3

Dr. P. M. Mehta says in Charaka Samhita " we have to day in India such a vast field opened up by the excavations of Mohan Jo daro and Harappa that our vision is carried back thousand of years before the period from which we hope to begin our history. This may not be Vedic or pre-Aryan in its nature but what is that to us who are concerened with history and history of medicine, in its wide all embracing numan aspect". 4.

In the Vedic age the physicians lived in cottages, built in open, surrounded by medicinal plants and herbs. In the Rig Veda over a thousand medicinal plants have been described, and certain trees and herbs are specially noted for their properties of purifying the atmosphere. The Vedas mention the rudiments of embryology, midwifery, anatomy, diseases of the children, hygiene, sanitation and other subjects. In the Atharva Veda there are many hymns deseribing different diseases of the body. A complete and full exploration of the subjects dealt there in, will supply illuminating information to the industrious scholars of research. In order to ascertain the antiquity of the Indian dentistry one has to revert to the age of the Vedas. There is a great difference of opinion as regards the Vedic period. The late Lokmanya Tilak in his " Orion "

determines the antiquity of the Vedas at about 4000 B.C. 5. This date coincides with the opinion of Muthu. 6. Modi states it to be 3100 B. C. 7. Other scholars are of the opinion that the hymns of the Vedas were composed in 2500 B. C. But we see that the Vedas are the splendid monuments for the history of Indian dentistry.

In the post-Vedic period, the new era of the Indian medicine begins. The Vedic literature which contained charms, mantras, magic medicine, and divine healing began to disappear and the empirical methods gradually dwindled away and brought in a revival of learning. The medical science underwent a change which ultimately based Ayurveda on systematic lines. Thus it will be seen that the evolutionary period of Ayurveda begins some where from the pre-Buddhistic age, and thence forth the science of divine knowledge became scientific, systematic and secular.



Chapter II

THE ACHIEVEMENTS OF DENTISTRY, EDUCATION AND INSTITUTIONS

In those primitive days, when in Egypt the dissected body of a dead mouse was used as a cure for tooth ache, when in Rome in the days of Galen the urine of an innocent boy was used as a mouth wash, when the worm theory prevailed in China, the dentistry in ancient India was at its zenith. For the Ayurveda with its voluminous materia medica had attained the highest standard of excellence which was unrivalled. The old Hindu doctors performed Cæsarian sections, trephining of the skull amputations, and other operations under the anæsthetic called "Sammohini" (सम्मोहिनी) and after the operation the patient was administered "Sanjivani" (संजीवनी) which restored him to senses. The modern method of X-Ray was found in a tree called "Bhisajya Raja" (भीसज्य राजा। which revealed an illuminating picture of the deeper structures of the body. The log of this tree contained a gem, and when this gem was put before the patient, it illuminated his body as a lamp lights up all the objects in a house. This gem was first used by Jivaka the cranial surgeon, who lived and flourished in 600 B. C. Nothing is known about this tree at present.

The medical and dental knowledge was imparted at the world famous University of Taksha Shila (Taxila) at Atrey medical school which accomodated 500 students in one class and where the curriculum was of seven years'

duration. Taksha Shila was a large and a prosperous city renowned for its excellent management. It was located 21 miles north-west of Rawalpindi. Taksha Shila has been mentioned for the first time in Ramayana and Mahabharata. It was built by Bharata the son of Kaikai. A faculty in charge of celebrated professors was noticeable in every department of art or learning. The selection of standard text books was made by the faculty of learning. Students flocked to Taksha Shila not only from every nook and corner of India but also from Arabia, Greece, Syria, China, and other parts of the world, as in the Middle Ages they mustered at Paris. Taksha Shila at the time of Alexander's invasion, became famous throughout all Asia, as the prominent seat of the Hindu temple of learning and conspicuous for its medical school throughout the East. Apart from medicine, military arts, astronomy, history, agriculture, commerce, magic, painting, and other subjects were taught at this famous seat of Hindu scholarship. The science of medicine was also taught at the University of Nalanda, and at Benares (Kasi) under the able and experienced guidance of principal Sushruta. The Augustan era of Ayurveda was from the days of Sushruta and Charaka to 750 A. D. We learn from the edicts of Asoka that hospitals were established by him in different cities of India. The historical information from Fa Hian and Hiuen Tsiang reveal that charitable hospitals and dispensaries were very common in ancient India. This is an eloquent testimony to the progress of medicine in those old days. The Hindu medicine excercised a vast influence on the development of the medical science in Europe.

Medicine in ancient India was studied by three classes of people having three different objects: (1) The Brahmins or the priestly class. (2) The Kshatriyas or the warriors for protecting the public and for acquiring glory for their services rendered to the people. (3) The Vaishyas or the trading classes and agriculturists for their livelihood. Out of these three castes, medicine was mostly studied by the Brahmins for the noble object of serving humanity. They were great scholars and research workers. A medical student after completing his Gurukul education required the following qualifications for entrance.

He should be of a good family of one of the castes of Brahmin, Kshatriya or Vaishya. He should possess an ardent desire to study with enthusiasm, patience, and energy. Sharp memory, self-control, purity of mind and soul, intellect, courage, clear insight, quick grasping power of the things were absolutely necessary. Further qualifications required were thin lips, thin fine teeth, intelligent, bright and innocent eyes with a benign contour of the mouth. A contented frame of mind, politeness in speech, and pleasing manners were also considered necessary. The minimum age required for admission was 16 years. He who did not possess these qualifications was considered unfit for studying medicine.

The gates of the temple of learning were carefully guarded by the authorities and only those top class students were admitted, who had satisfied the test of the committee of scholars called "Dwara Pundits". The selected student had to undergo a probationary period of six to

twelve months before securing the final admission. Only about twenty percent of the students got admission and majority of the candidates had to go back.

Then the student had to take an oath of initiation, before the sacred fire as instructed by the teacher. All the students during their period of studies had to stay with the preceptor, as there were not easy communications in those days, and only under exceptional circumstances were they allowed to go home. They were under the complete control and supervision of the teacher or the Guru, who took pains to teach them the science of medicine. The Guru took the best possible care of the students as regards their food, dress, health and other requirements. The student was known as " Brahmachari " or a calibate. He had to wear ochre coloured garments, and had to grow a beard. All the students paid a great respect to the Guru and called him as " Bhagwan " (Lord). The Guru addressed the student as " Vatsa " or a pupil. The teacher was the guardian of the pupils during their educational career, and treated the students like a father ruling over his family. His decision was final in all cases. The life of the students at the school was by no means easy or luxurious. The discipline was very strict. The students were either punished or fined for their misbehaviour and the students of the royal family were not an exception to the rule. All the pupils were treated by the Guru in a kind and sympathetic manner. But they were also rebuked or punished for their faults or mischief when necessary.

Knowledge was imparted in calm and pleasant open

air amidst natural surroundings. The student always sat on a clear ground or lawn which was on a lower level than the seat of the preceptor. This tradition of learning is existent even to day in India. It was because of the high reverence paid to the teacher for his learning, that placed him on a higher pedestal than the recipients of knowledge. This truth is established at present by modern educational psychology. The students had to recite verses word by word, in a distinct phonetic tone, which was neither very loud nor low and in solemn manner without making any movements of the eye brows or facial expressions. The preceptor used to explain the literal meaning of the stanzas. Then there were discussions followed by questions and answers. The verses were repeated over and over again till they remained fixed in the memory. A complete theoretical and practical training was given, and students were taught to perform operations. The professors possessed not only vast stores of knowledge and experience, but also a high standard of physical and moral equipment. They used to teach exceptionally well repeating their instructions and correcting the mistakes of the students, till they had learned the subject by heart. The teaching was oral and the students were supposed to remember everything. The readers will perhaps be surprised at the strong and capacious memory of the students in those days. The examination in theory and practice was very strict. The theoretical examination was called a needle test, by which a sharp needle or a probe was inserted at random in the pages of the text-book, and the page in which the needle was stuck was opened, and the student was put questions from that page. Jivaka's story quoted

somewhere in these pages is an example of practical examination.

The fee for the full course of studies was 1,000 coins (Dam) paid in advance at the time of securing admission. This included free boarding and lodging. Thus we find that the education in those days was very cheap looking to the long duration of seven years of residence with the Guru. The teaching institutions were encouraged and helped by the kings, the nobles, and the rich by their generous donations called "Vidya Dan" or charity for knowledge. Learning was greatly patronized by the grant of scholarships and other aids to the poor students by the philanthrophic people. Those students who were unable to pay their fees owing to straitened financial circumstances rendered services to the Guru in other forms. The following interesting incident may be cited of Jivaka, who went to principal Atrey of Taksha Shila. Atrey asked Jivaka "what will you pay me in return for your education"? Jivaka said "Oh lord all the way I have come on foot from Maghadha without consulting my parents, hence I will not be able to pay to you in money. But after completing my studies I shall devote my life at your service" Atrey was pleased with the answer and Jivaka was admttted to the medical school. He studied for seven years. In the final practical examination, Jivaka was asked, the description of the medical properties of the herbs, plants, and roots that grew in the area of fifteen miles of circumference of Taksha Shila. After the examination and experiments of four days Jivaka said "There is not a single plant which is devoid of medicinal virtue".

Later on the fame of Jivaka spread far and wide not only as a successful cranial surgeon, but also as a celebrated physician of Gautama Buddha. The king of Magadha named Bimbisar had conferred the highest honour of the "Royal doctor" (Raj Vaid) on Jivaka.

The students on the completion of their studies used to pay a lump sum according to their financial capacity to the preceptor, as a compensation for the knowledge they had received at his hands. This was known as "Guru Dakshina". After passing the final examination the title of "Snataka" or a graduate was conferred on the student. An ethical code was preached at the time of convocation ceremony which was both grand and grave. Higher training and researches were carried out by the post-graduates of Taksha Shila and Benares Universities by dedicating their whole lives to the acquisition of knowledge and learning by establishing Ashrams or hermitages in the Tapavana or the slopes of the Himalayas.

After the destructon of the University of Taksha Shila, the University of Nalanda attained international glory in 700 A. D. for its excelllent laws. The University had a fine imposing six storeyed building with towers and domes. Nalanda became renowned as a seat for higher learning. It was the largest University having about 10,000 students who flocked round the professors from India and different parts of Asia. The teaching faculty was in charge of more than 1500 professors. The boarding, lodging, and teaching was provided free to the students. The high expenditure was met from generous donations from the kings, the rich persons and the common people. Nalanda had an

excellent library. It was said that those scholars who had not received the seal of approval from this University were not considered as adequately learned.

The University of Vikramshila later on acquired fame in this direction. The brilliant achievements of the University of Benares (Kasi) will be described in the next chapter. A greater homage was paid to the learned personages who had rendered memorable services to the cause of knowledge than to the kings. An incident which took place at the convocation at the University of Vikramshila may be cited in this connection. When the king graced the occasion, no body got up from his seat on his arrival. But when the talented rector Jova–Atish (Dipankar) came, all persons including the king stood up and paid their respects to him. This clearly shows that it was the power of the gown that ruled the University and not the power the crown.

A physician after qualifying himself had to apply to the king or the state for permission to practise. After his name had been registered by the state, he was known as a "Vishikha" which meant he had completed his student's career and was on the threshold of his new profession. In spite of all possible care by the state to protect the interests of the qualified doctors, unqualified practitioners under the guise of real doctors carried on a flourishing trade. The foreigners had also to apply for registration and pass a difficult examination taken either by the royal doctor or by the council of physicians.

The ceremony of convocation was called "Samavartana" which was august and grand. The code of ethics was

preached by the Guru which reminded the students of the oath taken at the time of initiation before the sacred fire. An interesting moral code has been mentioned in Ayurveda.

The doctor was not supposed to praise his own learning or dexterity, when examining a patient he must be cool and calm. He should always console a patient even if the prognosis is bad, his manners should be decent and polite with the patient's relatives. He had to conform to a high standard of morality, he should be careful about his dress and appearance. He should not laugh with a woman, or go alone to examine a female patient. He was strictly forbidden to accept any present from a woman, without the sanction and knowledge of her husband. In a patient's residence he should talk politely. He should not look at women in patient's house or exchange talks with her in secrecy. He must avoid her if she was found making any signs or overtures of love. Consultations with doctors should be carried on in a friendly professional manner. In spite of heated discussions courtsey should not be overruled. The doctor must be convinced with scientific arguments and he must be impressed by quoting authoritative verses from the standard books. He must be exposed by detecting his mistakes. If he refused giving up his point, he should be challenged with very difficult and complicated questions till he has changed his mind. He should not behave in an insolent manner. He should try to win over him with soft words and charming manners befitting a perfect gentleman.

Thus it is evident that the great scholars like Panini, Jivaka, Naga Arjuna, Dipankar, Shilbhadra and others of the Indian universities added to the glory of our institutions by maintaining a high traditional standard of teaching. Grandiloquent testimonies have been paid by the foreigners like Arrian, Strabo, Alberuni, Royle, Jolly, Weber, Hoernle and others in their historical records.

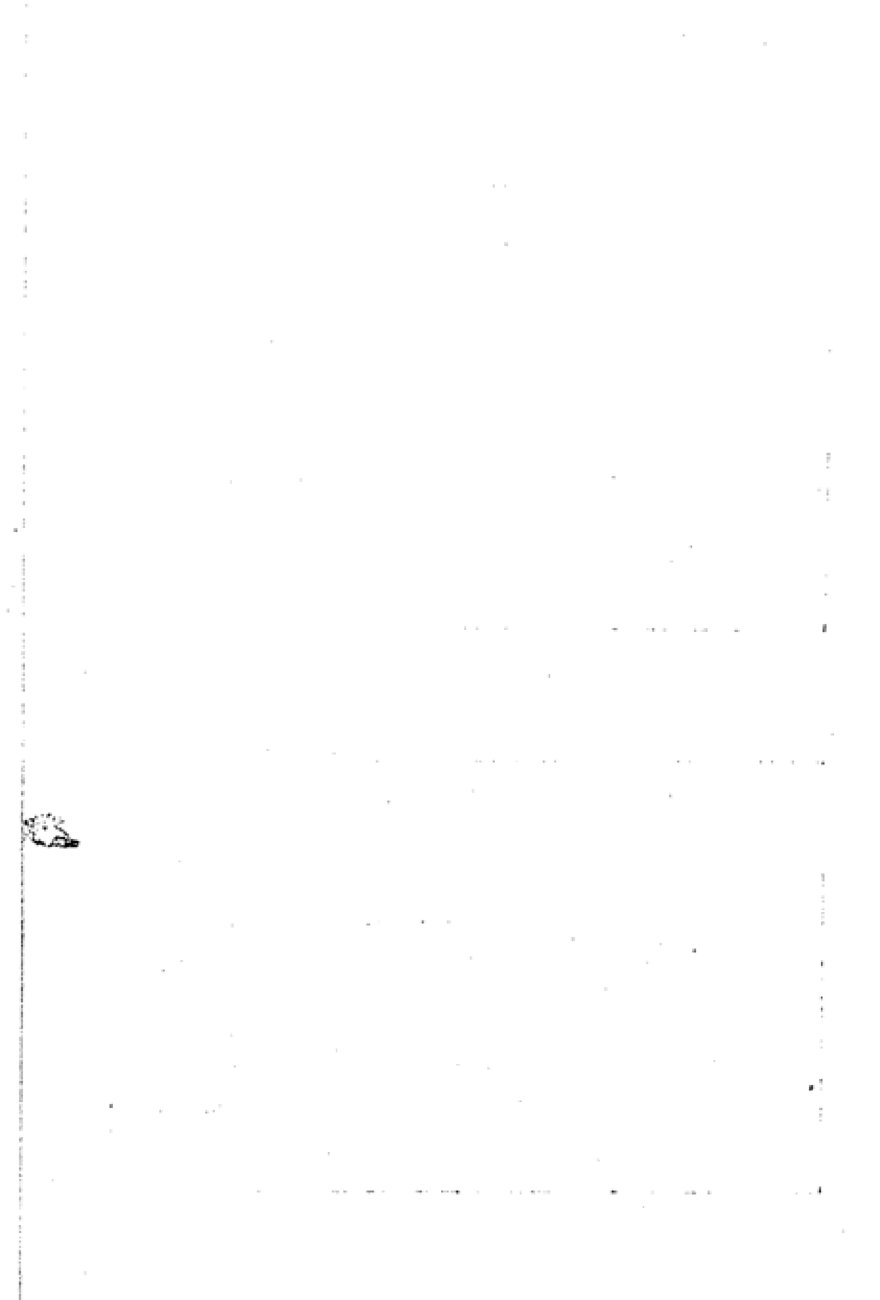




SUSHRUTA
(By Courtesy of Gita Mandir, Ahmedabad.)



DHANVANTARI
(By Courtesy of Shree Gulabkunvarba Ayurvedic Society Jamnagar.)



Chapter III

SUSHRUTA AND CHARAKA

The university of Benares or Kasi was one of the finest institutions of learning and it gave unique facility for the study of the science of surgery. I would like to pay my homage to the talented pundit Sushruta, the father of Indian surgery, without mentioning his glorious achievements in this field, the treatment of the subject will be considered incomplete. The name of Sushruta has been written in golden letters on the pages of dental history of India.

Sushruta was descended from the race of Vishwamitra, and the Mahabharata mentions him as the son of the royal sage. 1.

धन्वन्तरि धर्मभृतां वरिष्ठो वाग्विशारद : ।
विश्वामित्रात्मजमृषिं शिष्यंसुश्रुतमन्वशात् ॥
श्यामायनोऽथ गार्ग्यश्च जाबालिसुश्रुतस्तथा ।
विश्वामित्रात्मजा : सर्वे मुनयो ब्रह्मवादिन : ॥

He was said to be the contemporary of Rama the hero of Ramayana. He acquired the knowledge of the science of medicine from Divodasa the king of Kasi surnamed Dhanvantari at his Himalayan retreat. (Ashram). According to Sushruta, Divodasa was the reincarnation of Dhanvantari the celebrated physician of gods in heaven.

As regards the age in which Sushruta lived and flourished, there are great differences of opinion among

scholars. The whole question is intricate and obscure. Modi states that his work was written in 1500 B. C. 2. I fail to understand how Modi arrived at this conclusion. Muthu estimates it at about 1000 B. C. 3. According to G. N. Mukhopadhyaya, there are indications in the Satapatha Brahmana, a secondrry Vedic work, that the author was acquainted with the doctrines of Sushruta as regards osteology, the exact date of the work is not known, but it is likely to be in the neighbourhood of 600 B. C. 4.

Again in Hasti Ayurveda, a book on the treatment of elephants by Palakapya, we find surgical instruments described after the manner of Şushruta. Palakapya lived as a veternary surgeon in the court of Romapada, the king of Anga (East Bengal) which had as capital the famous city of Champa, identified with modern town of Bhagalpur. King Romapada was the contemporary of the king Dashratha, the father of Rama. Here we have a corroborative evidence of the age of Şushruta. 5.

The name of Sushruta is also mentioned in Varttikas of Katyayana, who flourished during 400 B. C. Thus there are sufficient reasons to believe that Sushruta lived about 600 B. C. It generally agrees with K. L. Bhishagratna. Karl Sudhoff and Sarton have accepted 600 B. C. as the age in which he lived. Garrison fixes him about 500 B. C.

Haas's theory that Sushruta is the Indian coined name for the Arabic word Suqrat or Buqrat and the name Kasi (Benares) has been applied to the island of Cos, is to be entirely rejected as a joke after refering to the work

of Prof. Max Neuberger, the medical historian of the university of Vienna. 6.

Sushruta was the principal and professor of operative surgery at the University of Benares. He was the first dental anatomist in the world, who had described the anatomy of the jaw bones with great accuracy. Hoernle says "Sushruta's way of counting jaw bones generally agrees with that of modern anatomy." As stated by Modi Sushruta has described the lower wisdom molar roots pressing the inferior dental nerve which is very rare 7. Mrs. Lilian Lindsay remarks "His knowledge of dental anatomy, and the internal anatomy of the head must have been considerable and in advance of that shown by many anatomists of a much later date." 8. Sushruta has devised about 125 instruments for operations of different parts of the body.

Out of the scattered and floating mass of medical literature, Sushruta has woven a fine texture of Samhita, which has won the approbation and popularity of the rank and file of scholars and the laity. In Sushruta Samhita, he has systematically arranged the experiences of earlier surgeons, and has collected scientific facts of surgical technique from ancient literature. In an orderly manner he has classified the operative methods His book describes the various problems of practical operations. It also deals with embryology, medicine, midwifery, hygiene and other things. The skilful handling of the forcep or a lancet must be laid down to the credit of this learned sage. The book has been divided into five main chapters:

(1) Sutra Sthana contains 46 chapters which deals with the fundamental principles (2) Nidana Sthana describing etiologic factors has 16 chapters. (3) Chikitsa Sthana or different forms of treatment has 40 chapters. (4) Sharira Sthana which gives the description of anatomy and physiology has only 10 chapters. (5) Kalpa Sthana, which contains the details of the treatment of toxicology has 8 sections. Other diseases in full details have been separately described in the appendix called Uttra Tantra which has 66 chapters. The final recension of Sushruta Samhita was made by Naga Arjuna, the great Buddhist scholar.

The work of Sushruta has been translated into Arabic in 800 A. D. The name of the book is as "Kitab Shawshoon-al-Hindi", or also called as "Kitab-i-Susrud". The work has been translated into Latin by Hessler (1844-1917) and in German by Vellurs. Sushruta's book has been translated into English by Prof. A. F. Hoernle in 1897 and by K. L. Bhishagratna in 1907. The first translation of it in Gujarati appeared in 1901 by Prabhuram J. Vaid of Bombay. It was subsequently published by Pandurang Jawji in 1938.

The following is the interesting story of the publication of the work of Sushruta as quoted from the work of G. N. Mukhopadhyaya. "The Government of India had ordered its publication in original Sanskrit. The first volume, and three fourths of the second of Sushruta, after having been printed was left unfinished, and it was considered by the Government as the accumulation of mere "waste paper" after spending a large sum on publication

in December 1835. But the Asiatic Society of Bengal published the complete work at their risk and cost and won the applause of the learned societies, as the first publisher of the original Sushruta Samhita". 9.

CHARAKA

Equally eminent is the scholarly contribution to the science of medicine which was expounded by the revered Punarvasu Atrey and was written by the talented sage Agnivesa. It was systematically revised and arranged by Charaka, the great physician. Charaka Samhita has been considered the most authoritative work on medicine. The last forty chapters were added by Dridhbala a native of the Punjab.

Who was Charaka and when did he live and flourish ? These are very interesting points, though very complicated and unsolved. From the dawn of literature till the present day, the name of Charaka has been remembered with respect and gratitude by the lovers of medicine, and Hindu scholars. As regards the period in which Charaka lived, there is a divergence of opinion among the scholars of oriental learning. Some say that he was a Rishi or a sage who lived at a very early period. This is the general opinion of the Indian scholars. Others believe that he was an avtar of "Shesha Naga" or the serpent king and the servant of Vishnu. The European Indologists put him as a court physician of the Indo-Scythian king Kaniska in 100 A. D. But we have no reasons to believe in this theory that Charaka, the court physician of king Kaniska was the same Charaka, the

writer of Charaka Samhita. The name Charaka found in other places does not necessarily prove that he was the same Charaka, the complier of Charaka Samhita. The title "Charaka". was also conferred on celebrated physicians as a compliment or a mark of respect, but that is a similarity in name only. We shall carefully scrutinise the following points, before accepting the conclusion arrived at by the French orientalist Sylivain Levi, based on the translation of the Buddhistic Tripitaka.

The Indian medical scholars place him at a remote antiquity. We have sufficient evidence to prove that Panini the great grammarian wrote and composed special Sutras for Agnivesa and Charaka. This proves beyond doubt that these names were famous. Otherwise Panini would not have mentioned these names in his work. Secondly Prof. Goldstuker has conclusively proved that Panini lived before 600 B. C. 10. Patanjali (200 B. C.) wrote a commentary on Charaka. Again Chakrapanl and Bhoja have signified Charaka as the redactor of Charaka Samhita. Thus we have good reasons to reject Levi's theory, that the real Charaka flourished in the period of king Kaniska in 100 A. D. Under the present circumstances, it is extremely difficult to discern the real truth about Charaka. But we hope that in future some diligent scholars will throw more light on the illustrious name of the great Charaka the father of Indian medicine.

Charaka Samhita has undergone several editions in different languages. The Arabic translation was published in the begining of 800 A.D. The title "Sharaka Indianus" has

been mentioned in the Latin translation of Rhazes (Al Razi), Avicenna (Ibn Sina) and Serapion (Ibn Serabi). The translation of Charaka from Sanskrit into Persian and from Persian into Arabic is mentioned in Fihrist (987 A.D.). Alberuni has also referred to Charaka's work. However the latest and the most uptodate translation of Charaka Samhita has been published in English, Hindi, and Gujarati in 1949 in six volumes by the editorial board of Shree Gulabkunvarba Ayurvedic Society of Jamnagar (Saurastra) under the able guidance of Dr. P. M. Mehta M. D., M. S., F. C. P. S.

Now we shall describe the section on diet and medicated smoking mentioned in Sutra Sthana chapter V from "Charaka Samhita". 11. We shall now expound the chapter entitled "Measure in eating". Thus declared the worshipful Atrey. One must eat in measure and the measure of food is determined by the strength of one's gastric fire. That should be known as the proper measure of food which, when taken is digested in due time without impairing one's health. In view of this Sali rice, Shashtika rice, green gram, common quail, grey partridge, antelope, rabbit, wapiti, Indian Sambar, and such other articles of food light by nature need to be taken in measure.

Similarly preparations of flour, sugar cane juice, milk, til, black gram, and flesh of aquatic and wet land animals, and other similar articles of food, though heavy by nature, also need to be taken in measure. However, from the above classification, one should not conclude that heaviness or lightness in an article of food is men-

tioned without reason. The light articles have a predominance of air and fire, others (heavy ones) have more of the properties of earth and water; consequently the light articles are stimulative of the gastric fire, owing to their innate qualities they are considered to be least harmful, even if they are taken to a surfeit. On the other hand, the heavy articles are by nature non-stimulative of the gastric fire due to their dissimilarity of nature. A surfeit meal of them is markedly harmful, unless the gastric fire is increased by hard exercise. Thus the measure in food is determined by the strength of the gastric fire.

It is not that the quantity of substance does not count. From the point of quality, it is laid down that heavy articles should be taken in one third or one half measure of the full meal, while even light articles should not be taken in excess and should accord with the strength of the gastric fire. The measured diet not only does not impair one's health but positively promotes one's strength, complexion, health and life.

The instructive verses are, that one should never accordingly eat such heavy articles as pastries (Mishtan) flattened rice, etc. on the top of a meal. Even while hungry, one should take such articles in right measure. Dried meat, dried vegetables, lotus, rhizomes, and lotus stalk, being heavy are not to be taken habitually, nor should the flesh of an emaciated animal be used. Coagulated milk, cream, cheese, pork, buffalo's flesh, fish, curds, black gram and wild barley should not be used habitually. Shastika rice, Sali rice, green gram, rock salt, (Sindhava) embelic

myrobalan, (Ambla) barley, rain water, milk, ghee, (clarified butter) flesh of jangala animals, and honey may be habitually taken. That should form the daily diet, which not only helps to maintain present well-being, but serves as a prophylactic against disease in future.

It is hoped that the treatment of medicated smoking will be interesting to our professional brothers. It is not necessary to discuss here the habitual smoking for luxury, which is also described in details by Charaka. Even specified times are laid down for habitual smoking. The description of medicated smoking is as follows:—

"Prepare a cigar from animal fat, ghee (clarified butter) and wax combined skilfully with the best drugs belonging to the category of sweet taste, one should use for unctuous smoke. The white mussel, shell creeper, staff plant, yellow arsenic, realgar, eagle wood, cinnamon leaf and other perfumes act as errhines.

Heaviness in head, rhinitis, headache, hemi-crania, ear ache, cough, hiccup, dysponea, throat spasms, weakness of the teeth, discharge from the ear, nose, and eye due to the morbid condition, nasal and oral fetor, tooth ache, anorexia, regidity of the jaws, and neck, pallor of the face, mucoid discharge from the mouth, cacophonia, Galsundika (Tonsillitis), Upjihvika (disease of the tongue) and some other diseases-all these are alleviated by smoking and the strength of the hair, of the bones of the head, of the sense organs, and the voice become augmented. Those who resort to oral smoking are not troubled even by severe Vayu and Kapha disorders affecting the upper

part of the body or the head. Thereby the Vayu and Kapha-born diseases affecting the supra clavicular upper part of the body do not afflict him. Smoking should be done thrice in three puffs each time. A wise man should practise habitual smoking twice a day. The unctuous smoke once a day, and the errhine smoke thrice or four times a day. Clarification of the mind, the throat and the senses, lightness of the head, and secretion of the excited humours are the signs of successful smoking.

Deafness, blindness, dumbness, hemothermia and giddiness are the complications arisiug from untimely smoking. In such conditions portion of Ghee, nasal medication, and eye applications and demulcent drinks are indicated. These should be combined with unctuous medication, if the provacation of Vayu occurs as sequela to Pitta provocation, and with cold medication, if there occurs hemothermia and with dehydrating medication, if Kapha and Pitta are both provoked.

Now I shall describe the persons to whom smoking is contra-indicated. The following persons should not smoke: One who is purged, one who has taken enema, a hemothermic, one affected with toxicosis, one who is grief-stricken and who is fatigued or intoxicated and suffering from chyme or Pitta disorders and one who had sleepless night, and suffering from fainting, giddiness, thirst, emaciation and from pectrol leisions, and one who has just taken wine, milk, unctuous beverage, honey, or curds; and one afflicted with dehydration, Sankhaka, Rohini (Diptheria) anomalies of urinary secretion and alcoholism.

If a person smokes in these contra-indicated conditions out of wantonness, his complaints becomes dreadfully aggravated by wrongful use of smoke. The person who is prescribed smoking, should smoke through the nose, in diseases of the head, the nose, and the eyes, and through the mouth in the diseases of the throat. When he inhales by the nose, he should exhale by the mouth. One inhaling by the mouth should not exhale through the nose, because the smoke passing in the reverse direction may quickly injure the eyes.

The self-possessed man, keeping the body and the eyes in upright condition, being whole hearted, sitting at ease and closing the nostril, should perform the three fold nasal smoking thrice by the other (free) nostril. For errhine smoke, the smoking pipe should be of the length of 24 finger's breadth, measuring with one's own fingers, for unctuous smoke it should be longer by a half than the first (36 finger's breadth).

The smoking pipe is recommended which is straight, interrupted by three bulges and has the proximal calibre of the size of a ziziphus stone and is made of the same materials as those of the enema pipe. The smoke which comes from a distance and is interrupted by the joints and attenuated by passing through the tapering pipe, taken with due consideration of dose and time, does not impair the senses. Know it to be a successful smoke, when the chest, throat and head feel light and the phlegm is liquified. Know it to be an unsuccessful smoke, if the voice is not clarified and the throat is filled with phlegm and

the head feels stiffend. When the palate, the head and the throat feel parched and heated all over, and the person feels thirsty or stupefied or bleeds profusely or his head feels extremely whirling or he becomes unconscious or his sense organ feels agitated, it should be known that smoking has been done in excess."

Sushruta says, that inhalations of the medicated fumes removes the clouding of the faculties of the organs of sense, preception and imparts clearness of the speech, and firmness of the teeth, of the hair of the head and of beard. It cleanses up the mouth and fills it with an aroma. The inhalation of medicated fumes guards against an attack of cough, asthama and aversion to food and clumsy sensation in the mouth, hoarsness, excessive salivation, nausea, somnolence, numbness of the jaws and other affections of the mouth due to an aggravation of deranged Vayu and Kapha.



Chapter IV

THE ANATOMY, MOUTH HYGIENE, AND DISEASES OF THE MOUTH

Now we shall enter upon the subject of anatomy according to Hindu Science. It will perhaps be surprising to the readers to learn that the ancient Hindu doctors were acquainted with human anatomy; as it is generally believed that the dissection of human bodies for the purpose of studying anatomical structure was not known in ancient India. The anatomy in its primitive form had its origin in the Vedic age, where we come across terms like heart, liver, brain, stomach, lungs, uterus, intestines and other organs.

Sushruta was the first surgeon, who was convinced that the dissection of a dead body was of paramount importance for a successful operator in surgery. The practical method of operations presupposed a sound and accurate knowledge of anatomy. He has remarked that an unskilful surgeon is a great danger to the public, for "theory without practice is like a one winged bird incapable of flight".

Bacon says in his essay on studies "To make judgement wholly by their (studies) rules is a humour of a scholar. They perfect nature and are perfected by experiences; for natural abilities are like natural plants that need pruning by study; and studies themselves do give forth directions too much at large except they be bounded in by experience" 1.

Dr. Wise in his Hindu system of medicine says. "The Hindu philosophers undoubtedly deserve the credit of having (though opposed by strong prejudice) entertained sound and philosophical views respecting the uses of the dead to the living, and they were the first scientific and successful cultivators of the important and essential of all the departments of medical knowledge-practical anatomy" 2.

With reference to dissections, Sushruta says "It is necessary to secure a dead body of a person whose age does not exceed 100 years, whose limbs are sound, and who at the same time has not died of a chronic disease or of poisoning". After cleaning the intestines of the corpse from a fæcal matter, it should be carefully covered with Munja grass, Kusa grass or the bark of the trees. Then the dead body should be inserted in a closed cage (so that it may not be eaten away or destroyed by aquatic animals.) It may be placed in a lonely place in the silent water of the river and it should be allowed to decompose for one week. Then the body may be taken out and it should be lightly brushed with grass roots, and Kusa blade, or a split strip of bamboo may be used for complete examination of the structures of the decomposed body. One who has observed and studied the deeper structures and organs of the body and who has thus become expert in the subject and is further confident of his knowledge is alone considered qualified and competent to practise the science of life and the art of healing. Thus a careful scrutiny was made of the eyes and every part and sub-division of the external and internal struc-

tures and different organs described in Sastras and the authoritative books were thoroughly studied.

The quartering of the animals like goats, sheep, horses and other animals at the time of Vedic sacrificial worship, supplied the materials for the study of comparative anatomy. On very rare occasions sacrifice of human life took place and this revealed a life like view of the human internal organs. At religious sacrifices when animals were quartered, the professor and the students availed themselves of the opportunity. A practical demonstration was given to the students.

Sushruta has described different limbs and members of the body, their number, cavities, channels, different kinds of bones, their location and extra muscles in women. Marmas have been divided as (1) Mansa Marma (2) Sera Marma (3) Snayu Marma (4) Asthi Marma (5) Sandhi Marma. Their full description and locations have been mentioned.

He describes 300 bones, 210 joints (sandhi), 500 muscles (pesi), 107 vital parts (Marmas). Sushruta has also described blood vessels, arteries, nerves, ducts, tendons, and other parts. The other teachers of Ayurveda refer to 360 bones. Sushruta has also explained the organs of sense and three humoral factors of Vayu, Pitta and Kapha in the chapter on Sharira Sthana. He has counted the jaw bones in the following manner :-

Talu (palate) Udakhula (alveolar process) Ganda (facial bone)	} Hanu or upper jaw

Udakhula (alveolar process)	}	2nd Hanu
Hanuvasti (base and chin)	}	or
Hanu mula bandhana (Rami)	}	lower jaw

THE MOUTH HYGIENE

It is an old and general belief that the Indians have beautiful and strong teeth. The laws of Manu enforced a strict code of hygiene which includes compulsory ablution. The Hindus have a high concept of hygiene. They will not take anything in the morning without cleaning their teeth and washing the mouth. There was a strict code of oral hygiene, which was based on religious sanction. Ths mouth being the gateway of the human body through which all the food and drink passed, it was kept scrupulously clean. Early in the morning, the brushing of the teeth was done with the twig of a tree, and this practice is transmitted to us from father to son from time mmemorial. The twig is popularly known as "Datana" or the Indian tooth brush. It was either of a babool, (astringent) neem (bitter) or banyan (sweet) tree. The twig is about elght inches in length, and in circumference equal to that of the little finger. A green twig is crushed and chewed at the proximal end till it becomes soft like a painting brush, so that it may not cause any injury to the gums. All the surfaces of the teeth were cleaned up and down slowly and gradually for about twenty to thirty minutes. Then the "Datana" (twig) is split up from the chewed end and is divided in two separate parts. One then half broken and bent in an inverted V shape is used as a tongue scraper. The chewing of the

twig gives an exercise to the jaws and juice extracted from it tones up the gums. Cháraka says "The tooth twig should be used twice a day. Teeth cleaning dispels oral fetor and dysgenasia, removes the impurities of the tongue and the teeth and the mouth, and promptly induces appetite. Twigs culled from Indian beech, Indian oleander Mudar, Arabian Jasmine Arjuna, Spinous Kino tree and such other trees are recommended for use in teeth cleaning. The tongue scraper should be without a sharp edge, curved and made of gold, silver, copper, tin or brass. The coating which accumulates at the root of the tongue and obstructs respiratory passages is the cause of fetor oris, therefore the tongue should be properly scraped. One desirous of cleanliness, relish and fragrance of breath, should keep in the mouth nutmeg, musk mallow, betel nut, cloves, cubeb pepper, good betel leaves, camphor and small cardamom.

The use of oil gargles imparts strength to the jaws, voice, and excellent plumpness to the face, fine sensitive-ness to the palate and a keen appetite. One using these gargles does not suffer from the dryness of the throat nor from the fear of the lips getting chafed. One's teeth do not become carious, but remains firmly rooted, they do not ache nor are they set on the edge by acidity but they are able to chew even the hardest of eatables." 3.

Even to day we find some Indians having very strong and healthy teeth, which can chew hard eatables like sugar canes and crack nuts without any injury. Sushruta recommended the following classes of trees. The twigs

of Khadira (Acacia Catechu), Madhuka (bassia Latifolia), Nimva (Melis Azadirachata) and Karanja (Pongami Glabra) are the best for using as "Datana" He also advises the use of some tooth powder. Bhavmisra (1550) in his publication on clinical medicine called Bhavprakash (Gujarati 1905) describes in details in an interesting manner the names of the twigs for the use of "Datana" with various advantages. The author strongly contra-indicates the use of certain twigs because of their ill effects. He also mentions the beneficial effects of the medicated gargles (Gundusha) in the diseases of the mouth, and washing the face with cold and lukewarm water. He also deals with medicated smoking as Charaka has done.

The use of the tooth brush is contra-indicated in various diseases of the mouth.

Herz Imbar says "Because orientals believe that most ailments are due to bad teeth, they pay more attention to those precious stones. During my wandering in the orient, I was struck with the fact that those people are seldom troubled with tooth ache. In the aged you notice the splendid array of white teeth all in a line like soldiers. Indeed every poet in the orient marks the beauty of his beloved lady in the emblem of white pearly teeth of which her ladyship is justly proud." 4.

Dr. R. Ahmed says "The use of the twigs as a tooth brush is as old as tha Himalayas". 5. Indian women also use the bark of the walnut tree to whiten the teeth and to beautify the vermilion border of the lips.

The tooth powder that was used was made of burnt almond shells or ordinary wood charcoal in eight parts, and one part of Sindhava (rock salt). This powder was either taken on the "Datana" or it was rubbed on teeth with the finger. In the common practice for massaging the gums, which is still current, purified castor oil is used to which is added a small amount of powdered rocksalt and camphor. Then the mixture is boiled for a few minutes and cooled. This is used for massaging the gums. It has a stimulating effect on the gums and refreshes the mouth.

I' Tsing in the records of the Buddhistic religion says "Every morning one must chew tooth wood (Danta Kastha) and clean the teeth and rub off dirt of the tongue, as carefully as possible. Only after the hands have been washed and the mouth cleaned is a man fit to offer salu-ation, if not both the saluter and the saluted are at faults." He further says "If one unavoidably comes near a superior while chewing the wood, one should cover the mouth with the left hand. Be careful to chew fully and polish the teeth and let all the mouth water come out and then to rinse abundantly with water. Take in the water from the nose once. This is the means of securing long life as directed by Buddhistya Naga Arjuna" 6.

After the meals, the mouth is thoroughly cleaned by gargling with water. The toothpicks advocated by Sushruta are still commonly used in our country, after the meals to remove the food particles lodged in the inter dental spaces. He says "Otherwise these will decompose

and the mouth would stink badly". After the food a "Pan" (betel leaf) was chewed, the practice of Pan eating still continues even at present. The Pan is astringent, exhilarant, carminative, stimulant, and full of aroma. It contains different ingredients which are mixed up proportionately with the betel leaf. They are lime, catechu, finely cut betel nut, clove, nutmeg, cardamom and other tasty spices. The pan is not to be swallowed like a morsel of food, but it is to be chewed slowly and gradually at ease. This chewing helps in automatic cleaning of the teeth, makes the teeth resistant against caries, which agrees well with modern saying "A clean tooth never decays".

Carren says "Poor as well as rich spend two hours every morning in rubbing their teeth with a small stick" 7. Dr. Johns of Darjeeling observes "I am to note as a result of my experiments and observations among primitive races in India, that they are in possession of excellent teeth and healthy mouths and that they achieved this without our present knowledge of prophylactics and our insanitary use of the tooth brush" 8. Dr. N. N. Bery states "A more careful examination of these ideas would lead to convictions that much which is new is not true, and that which is true is not new. If we pass to the care of the mouth, we can convince ourselves that we are only imitators. We are obliged to recognise that these methods were employed not in empiric manner as one would believe, but with a science gleaned from observations" 9.

Mr. Winston Churchill spoke before the Royal College of Physicians in March 1944 "The longer you can look

back, the further you can look forward". The past has been recalled here not in the spirit of pride but in that of humility to inspire the future.

Thus we here observe that the high standard of the hygiene of the Hindus, which was inculcated upon them by religious preachers at the dawn of civilisation, is still being observed in our country. The sanitary, and hygienic condition of the mouth played an important role of oral health in protecting the body against the ravages of focal infection. The evil effects of unclean and infected dental conditions, associated with the systematic disturbances, have been sufficiently brought to the notice of the civilised world. This knowledge is derived from our ancient Hindu literature of Ayurveda. America came to know this only in the year 1910, when Sir William Hunter revealed oral sepsis. This was known to the Hindu doctors of great antiquity. 65 diseases of the mouth were tabulated in those days out of which 19 were said to be incurable. Their description in Sanskrit is as follows:—

मुखरोगाः पञ्चषष्टिः सप्तस्वायतनेषु ।
तत्रायतनान्योष्ठौ दन्तमूलानि दन्ता जिह्वा
तालु कण्ठः सर्वाणि चेति । तत्राष्टावोष्ठयोः ।
पञ्चदश दन्तमूलेषु । अष्टौ दन्तेषु । पञ्च
जिह्वायाम् । नवतालुनि । सप्तदश कण्ठे ।
त्रयः सर्वेष्वायतनेषु ॥

In the following lines we shall discuss the interesting chapters of Nidanam and Chikitsa from Sushruta Samhita by K. L. Bhishagratna. 10.

Now we shall discourse on the Nidanam of Mukh Rogam (diseases of the mouth).

GENERAL CLASSIFICATIONS

Sixty five diseases of the mouth are known in practice. They are found to attack seven different localities viz. the lips, the gums, the teeth, tongue, palate, throat and the entire cavity. Of these 8 are peculiar to the lips, 15 of the roots of the teeth, 8 of the teeth, 5 of the tongue, 9 of the palate, 17 of the throat and 3 general.

DISEASES OF THE LIPS

The eight forms of disease whfch affect the lips are either Vataja, Pittaja, Kaphaja, Sannipatika, Raktaja, Mansaja, Medaja or Abhighataja (traumatic). The Vataja type:– The lips become dry, rough, numbed, black, extremely painful and the affected part seems as if it has been smashed and pulled out or cracked by the action of the aggravated Vayu. In the Pittaja type the lips become blue or yellow coloured and studded with (a large number of small) mustard like eruptions, which suppurate and exude a purulant discharge attended with a burning local sensation. In Kaphaja type the affected lips are covered with small eruptions, which are of the same colour of the surrounding part and become slimy, heavy, or thick cold and swollen. Pain is absent in this type and the patient feels an irresistible inclination to scratch the part. In the Sannipataja type the lips change colour, becoming black, yellow or ash coloured (white) at intervals and are found to be studded with various sorts of eruptions. In the

Raktaja type (produced by the vitiated condition of the blood) the affected lips look as red as blood and profusely bleed and chocolate coloured eruptions appear on their surface. In Mansaja type (due to the vitiated local flesh) the lips become heavy, thick and gathered up in the form of a lump of flesh. The angles of the mouth become infected with parasites, which germinate and spread themselves in the affected parts. In Medaja type (fat originated) the lips become numbed, soft, heavy and marked by an itching sensation. The skin of the inflamed lips become glossy, and look like the surface layer of clarified butter, exuding a thin crystal like (transparant) watery dicharge. In the Abhigataja (traumatic) type, the lips become red, knotty, and marked by an itching sensation, and seem as if pierced or cut open with an axe and become cracked and fissured.

DISEASES OF THE ROOTS OF THE TEETH

Diseases which are peculiar to the roots of the teeth are known as Sitada, Danta Pupputaka, Danta Veshtaka, Saushira, Maha -Saushira, Paridara, Upakusa, Danta Vaidarbha Vardhana, Adhimansa, and the five sorts of Nadi (Sinus).

In Sitada (Scurvy) the gum of the teeth suddenly bleed and become putrified, black, slimy, and emit a fetid smell. They become soft and gradually slough off. The disease has its origin in the deranged condition of the local blood and Kapham. Danta Pupputaka (Gum boil). The disease in which the roots of two or three teeth at a time is marked by a violent swelling and pain is called

Danta Pupputaka. It is due to the vitiated condition of blood and Kapham. Danta Veshtaka. The teeth become loose in the gums which exude discharge of blood and pus. This disease is due to the vitiated blood of the locality. Saushira. The disease in which itching and painful swelling appears about the gums attended with copious flow of saliva is called Saushira (alveolar abcess). It is caused by the deranged blood and Kapham of the locality. Maha Saushira. The disease in which the teeth become loose, the palate marked by sinuses or fissures, the gums putrified and the whole cavity of the mouth inflamed is called Maha Saushira, the outcome of concerted action of the deranged "Doshas" of the body. Paridara. The disease in which gums become putrified, worn off and bleed, is called Paridara (bleeding gums). The disease has its origin in the deranged condition of the blood, Kapham and Pittam. Upakusa. The disease in which the gums become marked by a burning sensation and suppuration and the teeth become loose and shaky (in their gums) in consequence and bleed at the least shaking is called Upakusa. There is a slight pain and the entire cavity of the mouth becomes swollen and emits a fetid smell. This disease is due to the vitiated condition of the blood and Pittam. Danta Vaidarbha. The disease which is a consequence of the friction of the gums marked by the appearance of a violent swelling about the portion so rubbed and in which the teeth become loose and can be moved about is called Danta Vaidarbha. It is due to an extraneous cause such as a blow etc. Vardhana. The disease which is marked by the advent of an additional tooth (wisdom molar) through the action of the deranged

Vayu with a specific excruciating pain of its own, is called Vardhana or the eruption of the wisdom tooth. The pain subsides with the cutting of the tooth. Adhimansa. The disease in which violent and an extremely painful tumor appears about the root of the tooth and is situated in the farthest end of the cavity of the cheek bone, accompanied by a copious flow of saliva, is called Adhimansa or epulis. It is due to the deranged Kapham and five sorts of Nadi (Sinus) which affect the roots of the teeth (are either Vataja, Pittaja, Kaphaja, Sannipataja or Abhighataja), their symptoms being respectively identical with those of the type of Nadi Vrana.

DISEASE OF THE TEETH PROPER

Diseases which are restricted to the teeth are named as Dalana, Krimi Dantaka, Danta Harsha, Bhanjaka, Sarkara, Kapalika, Syav Dantaka and Hanu Moksha.

Dalana is the disease in which the teeth seem as if cleft asunder with violent pain called Dalana or tooth ache, the origin of which is ascribed to the action of the aggravated state of the bodily Vayu.

Krimi Dantaka: The disease in which teeth are eaten up by worms is called caries. The teeth become loose and perforated by black holes accompanied by a copious flow of saliva. The appearance of an extremely diffused swelling about the roots of the decayed teeth, with a sudden aggravation of the accompanying pain without any apparent cause is also one of its specific features.

Danta Harsha: The disease in which the teeth cannot bear the heat, cold or touch is called Danta Harsha. It is due to the deranged condition of Vayu.

Bhanjaka: The disease in which the face is distorted, the teeth break and the accompanying pain is severe is called Bhanjaka (degeneration of the teeth). The disease is due to the deranged condition of Vayu and Kapham.

Sarkara: The disease in which sordes formed on the teeth and hardened (by the action of deranged Vayu) lie in a crystallised form at the necks of the teeth is called Sarkara (Tartar). Such deposits tend to destroy healthy growth and functions of the teeth.

Kapalika: The disease in which the preceding crystallised deposits get cemented together and afterwards separate from the teeth taking away a part of their coating is called Kapalika (calcareous deposits), which naturally makes an erosion in the teeth.

Syava Dantaka: The disease in which the teeth variously scorched by the action of the deranged Pittam assume a blackish or blue colour is called Syava Dantaka (Black teeth).

Hanu Moksha: The disease in which the aggravated Vayu (by such causes as loud talking, chewing of hard substances or immoderate yawning) produces the dislocation of the jaw bones is called Hanu Moksha. It is identical with Ardditam as regards its symptoms.

DISEASES OF THE TONGUE

The five kinds of the diseases which affect the organ of the taste are three sorts of Kantakas due to three

deranged Doshas (Vataja, Pittaja and Kaphaja), Alasa and Up-Jihvika. The Kantakas-In the Vataja Kantaka type the tongue becomes cracked, loses the sense of taste and becomes rough like a teak leaf. (giving the organ a warty appearance). In the Pittaja Kantaka, the tongue is coloured yellow and studded over with furred blood coloured papillae with the burning sensation (of Pittam in it). In Kaphaja Kantaka, the tongue becomes heavy, thick and over grown with vegetation of slender fleshy warts in the shape of Salmali thorns.

Alasa: The severe inflammatory swelling about the under surface of the tongue is called Alasa, which if allowed to grow on unchecked, gives rise to numbness and immobility of the organ and tends to a process of rapid suppuration at its base. The disease is caused by deranged blood and Kapham.

Up-Jihva: The disease in which a (cystic) swelling shaped like the tip of the tongue appears about the under surface of that organ by raising it a little is called Up-Jihvika (Ranula). The accompanying symptoms are salivation, burning and itching sensation in the affected organ. These are due to daranged Kapham and blood (of the locality).

DISEASES OF THE PALATE

The diseases which are peculiar to the part of the palate are named Gala Sundika, Tundikeri, Adhrusha, Mansa Kachhapa, Arvuda, Mansa sanghata, Talu pupputaka, Talu Shosha, Talu paka.

Gala Sundika: The diffused elongated swelling caused by deranged blood and Kapham, which first appears about the root of the palate and goes on extending till it looks like an inflated skin bladder is called Gala Sundika (tonsillitis) by physicians. Thirst, cough, difficult breathing are the indications of the disease. Tundikeri: A thick swelling resembling the shape of the fruit of Tundikeri plant appears at the root of the palate attended with a burning or pricking pain and suppuration is called Tundikeri (abcess of the tonsil).

Adrusha: a red numbed swelling appearing about the same region as the effect of the vitiated blood of the locality, attended with severe fever and pain is known as Adrusha.

Mansa Kachhapa: A brownish and slightly painful swelling somewhat like the back of a tortoise (and appearing in the region of the soft palate) is called Mansa Kachhapa. The disease is slow in its growth or development and it is due to the deranged Kapham.

Arvuda: A swelling shaped like the petal of a lotus lily and appearing in the region of the soft palate as an outcome of the aggravated condition of the local blood is Arvudam. The swelling is identical with Rakataruda.

Mansa Sanghata: A vegetation of morbid flesh at the edge or extremity of the soft palate through the action of deranged Kapham is called Mansa Sanghata. It is painless.

Talu pupputaka: A painless permanent swelling to the shape of Kola fruit (plum) caused by deranged fat and

Kapham at the region of the soft palate is called Talu pupputaka.

Talu Sosha: The disease of the soft palate in which the patient feels a sort of parched sensation with dysponea and a severe piercing pain in the affected part is called Talu Sosha. It has its origin in the aggravated condition of the bodily Vayu acting in concert with deranged Pittam.

Talu paka: The disease in which the deranged Pittam sets up a very severe suppurative process in the soft palate is called Talu paka.

DISEASES OF THE THROAT AND LARYNX

The diseases peculiar to the throat and the larynx are seventeen in number and are known as five types of Rohini, Kantha Saluka, Adhi Jihva, Valaya, Valasa, Eka Vrinda, Vrinda, Sataghni, Gala Vrdridhi, Galaugha, Swarghana, Mansatana and Vidari.

General features of Rohinis: The aggravated Vayu, Pittam, Kapham either severally or in combination or blood may affect the mucous of the throat and give rise to vegetations of fleshy papillae which gradually obstruct the channel of the throat and bring on death. The disease is called Rohini or diphtheria.

The Vataja Rohini: A vegetation of extremely painful fleshy (nodules) crops up all over the tongue, which tend to obstruct the passage of the throat and are usually accompanied by other distressing symptoms, characterised of the deranged Vayu.

Pittaja Rohini: The Ankuras or nodules in present type are marked by a speedy growth and suppuration and are accompanied by a burning sensation and high fever. Kaphaja Rohini: The Ankuras or nodules become heavy and hard and characterised by slow suppuration, gradually obstructing the passage of the throat.

Sannipatika type: Suppuration takes place in the deeper starta of the membrance accompanied by dangerous symptoms peculiar to the aforesaid types of diseases. It is rarely amenable to treatment.

Raktaja type: Symptoms characteristic of Pittaja type of the disease are present and the fleshy outgrowth in the throat is found to be covered with small vesicles. This type is incurable.

Kantha Salukam: The disease in which a hard rough nodule grows (Granthi) in the shape of a plum stone and crops up in the throat. It seems as if it has been stuffed with the bristle of a Saluka insect or been pricked by thorns is called Kantha Salukam. The disease is due to the action of the deranged Kapham. It is amenable to surgical treatment only.

Adhijihva: A small swelling like the tip of the tongue caused by the deranged blood and Kapham, over the root of the tongue is called Adhijihva. It should be given up as soon as the suppuration sets in.

Valaya: A circular or ring shaped raised swelling obstructing or closing up the upper end of oesophagus

(structure of oesophagus) is called Valaya. It cannot be cured and hence should be given up. It is due to deranged action of Kapham in the locality.

Valasa: The disease in which unusually aggravated Vayu and Kapham give rise to a swelling in the throat, which is extremely painful and causes a difficulty of respiration, ultimately producing symptoms of complete asphyxia is called Valaya by learned physicians and it is very difficult to cure.

Eka Vrinda and Vrinda: The disease in which a circular raised heavy and slightly soft swelling appears in the throat attended with itching and slightly burning sensation and a slight suppuration is called Eka Vrinda. The disease is due to the effect of vitiated blood and Kapham. The disease is round elevated swelling attended with high fever and a slightly burning sensation is formed in the throat through the aggravated condition of blood and Pittam and it is called Vrinda. A piercing pain in the swelling points to the Vataja origin.

Sataghni: The disease in which through the concerted action of deranged Vayu, Pittam and Kapham, a hard throat obstructing Varti (Jagged membrane) edged like a Sataghni (a weapon used in ancient warfare) and densely beset with fleshy excrescences is formed along the inner lining of that pipe and it is denominated as Sataghni. Various kinds of pains (due to Vayu, Pittam and Kapham) are present in this type, which should be necessarily considered as irremediable.

Gilayu: The disease in which aggravated Kapham and blood give rise to a hard slightly painful glandular swelling in the throat to the size of the stone of Amlaka fruit is called Gilayu. A sensation as if a morsel or bolus of food is stuck in the throat is experienced, which by its very nature is a surgical case.

Gala Vidradhi: The disease in which an extensive swelling occurs along the whole inner lining of the throat owing to the concerted action of deranged Vayu, Pittam, and Kapham is called Gala Vidradhi of Sannipatika type.

Galaugha: The disease in which a large swelling occurs in throat so as to completely obstruct the passage of any solid or liquid food and also that of Udana Vayu (choking the pharynx and mouth of esophagus) attended with high fever is called Galaugha. The origin of which should be ascribed to the action of deranged blood and Kapham.

Svaraghna: The disease in which the patient faints owing to the choking of the larynx by the deranged Kapham, which is marked by stertorous breathing, hoarseness, dryness and paralysed condition of the throat is called Svaraghna which has its origin in deranged Vayu.

Mansatana: The disease in which a pendent spreading and extremely painful swelling appears in the throat which gradually obstructs the pipe is called Mansa-tana. It invariably proves fatal and is caused by deranged Vayu, Pittam and Kapham.

Vidari: The disease in which a copper coloured swelling occurs in the throat marked by a pricking and burning sensation and the flesh of the throat gets putrified and sloughs off (and emits a fetid smell) is called Vidari. The disease is of Pittaja origin and is found to attack that side of the throat on which the patient is in the habit of lying.

The diseases in the entire cavity: Causes which are found to invade the entire cavity of the mouth (without being restricted to any particular part) may be either due to Vataja, Pittaja, Kaphaja, or Raktaja type and are known by the general name Sarvara Sara.

In Vataja type the entire cavity of the mouth is studded with vesicles attended with a pricking sensation in their inside. In the Pittaja type a number of small yellow or red coloured vesicles attended with a burning sensation crops up on the entire mucous membrane, lining the cavity of the mouth. In Kaphaja variety, a similar crop of slightly painful itching vesicles of the same colour as the skin (is found on the entire inner surface of the mouth). The blood originated Raktaja type is nothing but a modification of the Pittaja one (giving rise to similar symptoms,) it is also called by others as Mukha paka.

CHIKITSA (TREATMENT)

Now we shall discourse on the medical treatment of the affections of the mouth (Mukha Rogo).

THE TREATMENT OF VATAJA OSTHA-KOPA

In a case of inflammation of the lips (Ostha Kopa) due to the action of deranged Vayu, the affected part should be rubbed with an ointment composed of four kinds of lardaceous (Sneha) substance mixed with wax. Fomentations in the manner of Nadi Sveda should also be resorted to by an intelligent physician. Application of the "Salvana" poultice and those of the medicated oils possessed of the virtues of subduing deranged Vayu as errhines and Mastikya (Siro Vasti) are also recommended. The lips should be treated with powder of Sri Veshtaka, Saraja Rasa, and Sura Daru.

TREATMENT OF PITTAJA OSTHA-KOPA.

In case of Ostha-Kopa of traumatic origin (Abhighataja) etc. or due to the deranged action of blood or of Pitta bleeding from the affected part, should be done by the application of leeches and all the measures and remedies (Samshodhana and Samsamana) mentioned in connection with the treatment of the Pitta Vidradhi should be likewise employed.

TREATMENT OF KAPHAJA OSTHA-KOPA.

The use of medicated Siro-Virechana, fumigations, fomentation and Sveda gargles prepared from Kapha subduing drugs should be recommended after blood letting in the Kaphaja type of Ostha-kopa. The swollen and inflamed lips should be treated with a compound consisting of Trikatu, Yava-Kshara, and Vid-Lavana pounded together and made into a thin paste with admixture of honey.

TREATMENT OF MEDAJA-OSTHA-KOPA.

In a case of the fatty type of the disease of the lips the affected part should be fomented and incised when suppurate, should be purified and cauterised with fire. A paste compound of Priyangu, Triphla, Lodhra and honey should be rubbed over the affected part (Prati-Sarana). These are the remedies for curable types of diseases of the lips.

TREATMENT OF DANTA MULA.

Now we shall describe the treatment of the affection of the roots of the teeth. In case of Sitada type of the disease, the gums should be first bled and decoction of Sarshapa, Nagra, Triphla and Musta mixed with Rasanjana should be used as gargles. The gums should be plastered (Pralepa) with Priyangu, Musta, and Triphla and clarified butter cooked with the decoction of Triphla, Madhuka, Utpala and Padmaka should be used as an errhine. In an acute case of Danta-Pupputaka, the gums should first be bled and rubbed with five officinal kinds of salts and Yavakshara mixed with honey. The use of errhines medicated snuffs (Nasya) and demulcent food is recommended.

TREATMENT OF DANTA-VESHTA ETC.

In case of Danta-Veshta the swelling should be first bled and then rubbed with a pulverised compound of Rodhra, Pattanga, Yashti-Madhu and Laksha mixed with profuse quantity of honey. A decoction of the bark of Kishiri trees mixed with sugar, honey and clarified

butter (as an after-throw) should be used as gargles. Clarified butter cooked with the drugs of Kakolyadi group with ten times its own weight of milk should be used as snuff. In case of Saushira the affected part after being bled should be plastered with Lodhara, Musta, Rasanjana pounded together and mixed with honey. A decoction of Kishri trees should be used as gargles, and clarified butter cooked with the paste compound of Sariva, Utpala, Savra, Aguru, Chandanna and ten times of its weight of milk should be recommended as an errhine.

TREATMENT OF PARIDARA ETC.

In case of Paridara the treatment should consist of the remedies described in connection with Sitada. In case of Upakusa as well the system of the patient should be cleaned both ways (by means of emetics and purgatives) and his head should be cleaned with Siro-Virechana and the affected part should in addition be bled by rubbing it over with leaves of Kako Dumbarika or of the Goji or with application composed of five officinal kinds of salts and Trikatu mixed with honey. Tepid water solutions of Pippali (white) Sarshapa, Nagra and Nichula fruits should be used as gargles. The use of clarified butter cooked with drugs of Madhura group as errhine and gargles are also recommended.

TREATMENT OF DANTA-VAIDARBHA ETC.

In case of Danta Vaidarbha, the regions about the roots of the teeth should be cleaned by opening them with an instrument and subsequently treated with alkaline

applications, cooling measures should also be resorted to during the treatment of the disease. In case of an Adhika-Danta (wisdom-tooth) the tooth should be uprooted and removed and if there is bleeding, it should be cauterised by fire and then an experienced physician should apply the remedies under the head of worm-eaten teeth.

TREATMENT OF ADHIMANSA.

In case of Adhimansa, the additional fleshy growth about the roots of the teeth should be surgically removed and treated with a compound of Vacha, Tajovati, Sarjika, Patha, and Yava-Kshara, pasted together with honey or powdered Pippali, mixed with honey should be used as gargles, and a decoction of Patola, Triphla, and Nimba for washing the affected part. Errhines and inhalation of Virechana smoke that leads to the secretion of mucous from the head would likewise prove efficacious in such cases.

TREATMENT OF DANTA NADI.

In case of Danta Nadi the treatment of Nadi (Sinus) about the teeth is identical with that of sinus in general. The specific remedial measure, however is that the gum of the affected tooth should be incised and the tooth should be extracted if it be not in the upper jaw. The affected part should be purified and cauterised with an alkali or fire. Hence in a case of sinus a complete extraction of any fragments of broken bone or tooth is absolutely necessary for complete cure, otherwise if left

unextracted the sinus would run below the jaw. If the affected tooth lie in the upper jaw and if is very firm though attended with a toothache should not be extracted, as it might produce an excessive hemorrhage from its roots and usher in blindness, facial paralysis or other dangerous affections such as convulsions etc. due to excessive loss of blood. A decoction of Jati, Madana, Svadu-Kantaka and Khadira should be used as a mouth wash, and oil cooked Jati, Madana, Katuka, Svadu-Kantaka, Yasti-Madhu, Rodhra, Manjishtha and Khadira should be used to clean the sinus and heal a sinus invading the roots of a tooth. The remedial measures to be employed in the diseases affecting the roots of the teeth have thus been described above.

We shall now proceed to describe the medical treatment to be employed in the diseases which confine themselves exclusively to the teeth.

TREATMENT OF THE DISEASES OF THE TEETH PROPER.

A case of Danta Harsha yields to the use of any Sneha or the Trivrita-ghrita or the decoction of Vayu subduing drugs like gargles. An application of Snaihika Dhuma (emulsive fumes) and the use of snuff (Nasya), emulsive articles of food, meat soups, gruel, prepared with meat (Rasa-Yavagu), milk cream, (milk) clarified butter Siro-Vasti and other Vayu subduing measures generally prove efficacious. In a case of Danta-Sarkara (Tartar,

calcareous deposits on teeth) the deposit should be carefully removed without injuring the tooth, after which the part should be dusted (Pratisarana) with powdered Laksha with honey. All the remedies mentioned in connection with the treatment of Danta-Harsha may also be employed in this disease.

TREATMENT OF KAPALIKA ETC.

These remedies are also efficacious in a case of Kapalika, which is extremely hard to cure. In case of Krimidanta (caries) found to be firm and unloosed in the socket, the affected tooth should be fomented and the accumulation of pus, blood etc. should be removed. It should then be treated with the same Vayu subduing errhines of the Ava-pida form and with emolient gargles as well as with plasters prepared with Varsha-Bhu and the drugs of the Bhadra-dravidi group and with a diet of emulsive articles of food. In case however where the tooth is loose, it should be removed and the cavity cauterised with fire or an alkali. An oil cooked with the paste of Vidari, Yasti-Madhu, Sringataka and Kaseruka and with ten times its own weight of milk should be administered as an errhine. The course of treatment in a case of Hanu-Moksha will be described later on. A person suffering from any affections of the teeth should refrain from taking acid fruits, cold water, dry food and brushing his teeth with a twig. The treatment for curable types of dental diseases has been described above, and we shall now proceed to describe the treatment for incurable types of tongue diseases.

TREATMENT OF TONGUE DISEASES.

In Vataja type of Jihva-Kantaka, (papilla) the treatment should be the same as in case of Vataja Ostha–Kopa. In Pittaja type of Jihva–Kantaka, the vitiated blood should be made to secrete from the affected organ by rubbing it with any article of rough surface (such as leaves of Sakhotaka) and the drugs of Madhura (Kakolyadi) group should be used for gargles as well as for being rubbed over (Prati–Sarana) the affected organ. In the Kaphaja type the organ should be bled by scarifying it (with a Mandala Patra and such other instrument). It should then be rubbed with the powder of the drugs of Pippalyadi group mixed with honey. A compound of powdered white mustard seed and Saindhava, should be administered for gargles and the patient should be made to take his food with soup of Patola. Nimba, and Vartaku mixed with a liberal quantity of Yava–Kshara.

TREATMENT OF UPA–JIHVA.

In Case of Upa–Jihva (Ranula) the affected part should be scarified and rubbed with an alkali, and the patient should be treated with errhines, gargles, and inhalations of smoke.

The treatment of the tongue diseases has been thus described above. We shall now describe the medical treament of the diseases of the palate.

TREATMENT OF TALU–GATA IN CASE OF GALA–SUNDIKA.

The Sundika (Protuberance) should be drawn out along the tongue with the help of thumb and second

finger of the hand or with a Samdamsa (forcep) and then cut off with a Mandalagra instrument; but it should be cut neither more nor less than three quarters of the appendage, inasmuch as profuse hemorrhage might follow an excessive incision and death might result there from. Where a case of lesser severance is usually found to be attended with swelling, excessive salivation, somnolence, vertigo, darkness of vision etc; hence a surgeon well versed in the science of surgery and well skilled in practical operations should carefully operate Gal-Sundika (with a knife) and subsequently adopt the following measures. The incidental ulcer should be treated with pulverised compound of Maricha, Ati-Visha, Patha, Vacha, Kushtha, and Kuttannta mixed with honey and rock salt. A decoction of Vacha, Ati-Visha, Rasana, Katuka-Rohini. and Pichu-Marda should be used as gargles. The five drugs viz. Ingudi, Apandraga, Danti, Sarala, and Deva-Daru should be pasted together and made into Vartis (sticks) well flavoured by the addition of perfuming drugs. Twice every day, morning and evening, should the patient be made to inhale the fumes of these burning Vartis (sticks), which have the property of subduing Kapha, and should be made to take soup of Mudga boiled in alkaline water. In case of Tundikeri, Adhrusha, Kurma, Mansa-sanghata, and Talu-Pupputa, the preceding measures should be adopted. But the surgical operation should vary with the nature of particular disease under treatment.

TREATMENT OF TALU-PAKA ETC.

Remedies which destroy the deranged Pitta, should be used in Talu-Paka (suppuration of the palate) while

application of Sneha etc. and Sveda (fomentations) as well as Vayu subduing measures should be the remedies in case of Talu-Sosha (swelling of the palate).

Remedies to be employed in the diseases affecting the palate have been thus described above. Now here we discourse on the remedial measures in Kantha-Roga (diseases of the throat).

TREATMENT OF THROAT DISEASES.

In curable type of Rohini, blood letting and the applications of emetics, gargles, inhalations of the medicated fumes and errhines (Nasya) are efficacious. In case of Vataja Rohini, blood letting should be first effected and the affected part should then be rubbed with salts, gargles of tepid Sneha (oil, clarified butter etc.) should be constantly resorted to. In case of Pittaja Rohini the powdered Pattanga, honey and sugar should be rubbed (Prati Sarana) over the affected part and decoctions of Draksha and Parushaka should be used as gargles. In Kaphaja type of Rohini the affected part should be rubbed with Katuka and Agra Dhuma (chimney soot) and oil properly cooked with Sveta, Vidanga, Danti, and Saindhava should be used as Nasya and gargles. In case of Raktaja Rohini, a physician should use the same measures of the treatment, as in the Pittaja type of the disease.

TREATMENT OF KANTHA-SALUKA.

In a case of Kantha-Saluka, it should be bled and treated as a case of Tundikeri and the patient should be instructed to take a single meal in the day consisting of a

small quantity of Yadvana (barley rice) with clarified butter. The treatment of Adhijihvika should be the same as that of Upa-Jihvika. In case of Eka-Vrinda, blood letting of the affected part should be performed by application of leeches and Sodhana (purifying) remedies should be employed. The treatment of a case of Gilayu consists of surgical operation on the seat of the disease. Incision should be made into a Gala-Vidradhi (throat abscess) in its suppurated stage and appearing at a part other than a *Marma* (Vulnerable part)

TREATMENT OF SARVA-MUKH ROGA.

The affected part should be rubbed with powdered salts, in case of Sarva Mukha Roga (invading the whole cavity) due to the aggravated Vayu. Oil cooked with the decoction and paste of Vayu subduing drugs (such as Bhadra Dravidi group etc.) used as errhines (Nasya) and gargles are efficacious in the disease. After the application of this oil, the patient should be treated with Snaihika form of fumigation in the following manner. Tuntuka leaves smeared with honey should be plastered with a compound of Sara of Sala, Pipala and castor wood, the marrow of Ingudi and Madhuka, Guggula, Dhyamaka, Mamasi, Kaluna-Sariva Sri (Lavanga) Saraja-Rasa, Sailiya and wax pounded together and mixed with an adequate quantity of clarified butter or oil. It should then be burnt and the patient made to inhale the fumes. This treatment is successful in the disease. It destroys the Vayu and Kapha and proves curative in all affections of the mouth. In Pittaja type of Sarva-Mukha Roga all the

morbid principles (Doshas) should be eliminated from the patient's body, (with emetics and purgatives) and all kinds of sweet soothing and Pitta subduing drugs should be administered. Medicated gargles, fumigation, rubbing and purifying measures as well as Kapha subduing remedies should be used in Kapha type of Sarva-Mukha Roga and the patient should be made to take one Dharma measure (twenty four Ratis) of powedered Ati-Visha, Patha, Dev Daru, Katuna and Kutaja seeds with an adequate quantity of cow's urine. This acts as a potent remedy for all the Kaphaja disorders of the body. Gargles with milk, sugar cane juice, cow's urine, curd cream, Kanjika oil, clarified butter should be prescribed according to the nature of aggravated Doshas, involved in case of the mouth diseases. We have described above the medical treatment of the affection of the mouth which yields to medical remedies. Now we shall enumerate the different incurable types of mouth diseases.

Of the types of Ostha-Paka those due to vitiated condition of flesh or blood and those due to the concerted action of aggravated Doshas (Sannipatika) should be deemed as incurable. Of the diseases peculiar to roots of the teeth, the affections known as Sannipatika, Danta Nadi, (Sinus), Saushira should also be deemed as incurable. Of the diseases of the teeth, Dalana Bhanjana, Syava Dantaka and Alasa of the tongue are incurable and similarly among the palate diseases. Arvuda is incurable. Of the throat diseases, Svaraghana, Valaya, Vrinda, Valasa, Vidarika, Galaugha, Mansatana, Sataghni and Rohini should be regarded as beyond the pale of medicine. The nineteen

kinds of the diseases mentioned above are incurable and the medical treatment of these diseases should be taken in hand without holding out any definite hope of recovery.



Chapter V.

SURGERY, RHINOPLASTY, HEMORRHAGE AND INSTRUMENTS.

The old Hindu doctors were acquainted with the process of operations of dental extractions. The preceptor used to teach the students methods of removal of the teeth by practical experiments on dead bodies and animals. The art of operation, excision and the method of cutting in upward or downward direction was demonstrated by an incision made on leather bags filled with water, bottle gourds, water melon, and such other things. Extractions were performed with forceps and elevators. A glance at the ancient dental instruments will give an idea of the type of instruments used in those days. Sushruta advised the removal of a lower wisdom molar and then the application of cautery in the socket.

उध्धृत्याधिकदन्तं तु ततोऽग्निमवचारयेत् ।
कृमिदन्तकवच्चापि विधिः कार्यो विजानता ।

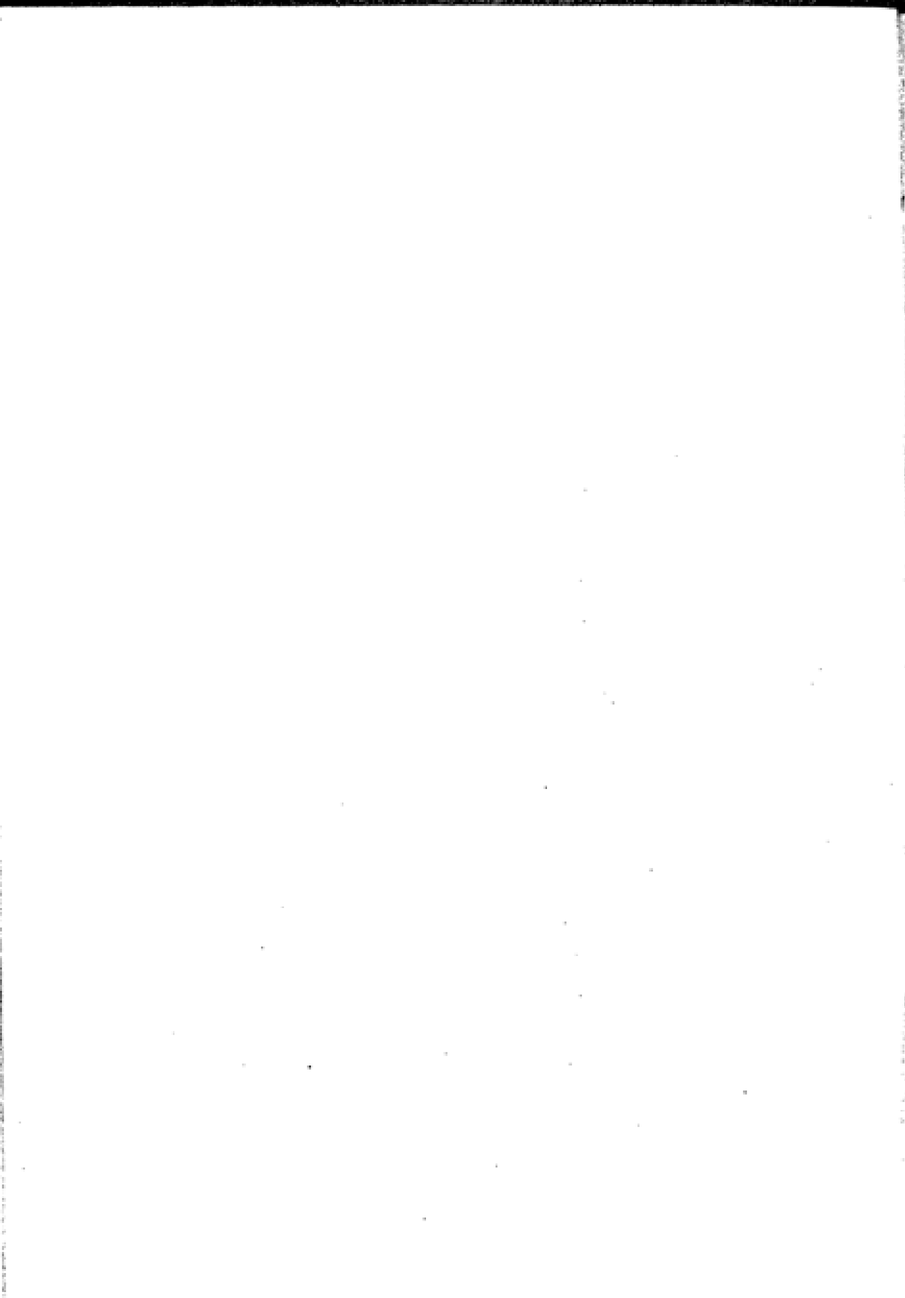
He has distinctly stated that an upper molar, if it is very firm, should not be extracted, because complications arising from it are likely to impair vision of the patient. Even to-day there is a general belief among the Indian patients that the extraction of a very strong upper molar is likely to do harm to the eye-sight. This we learn from the following passage.

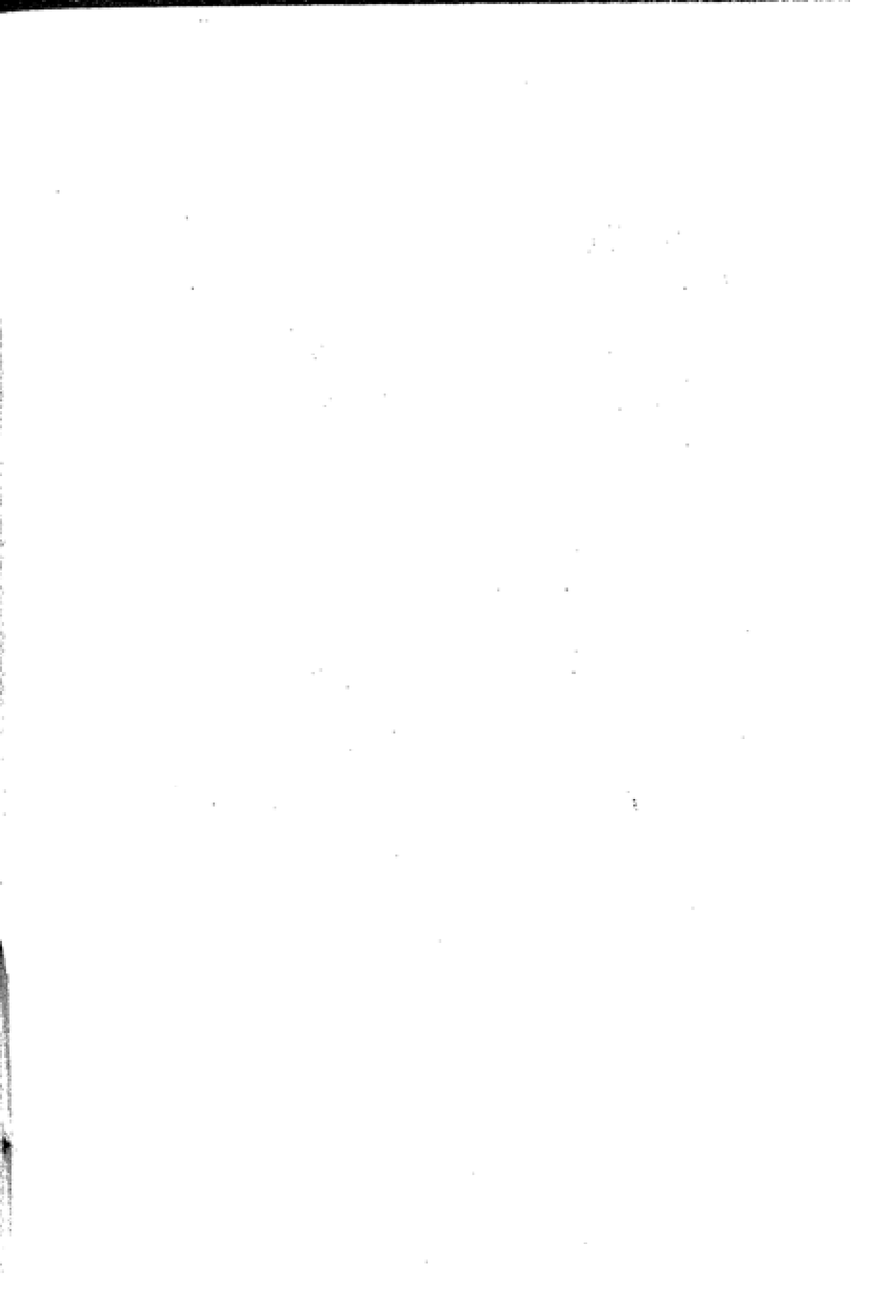
उध्धृते तूत्तरे दन्ते शोणितं प्रस्रवेदिति ॥
रक्तातियोगात्पूर्वोक्तारोगा घोरा भवन्ति हि ।
काणः सञ्जायते जन्तुरर्दितं चास्य जायते ॥

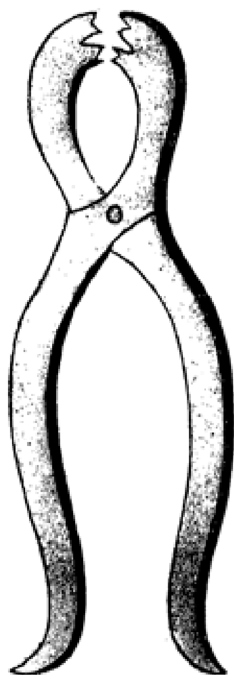
Kakamukha Svastika
(Crow forcep)

Kankamukha Svastika
(Heron forcep)
(after Thakore Saheb)

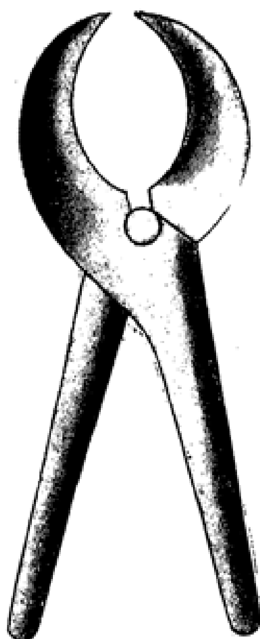
Kankamukha Svastika





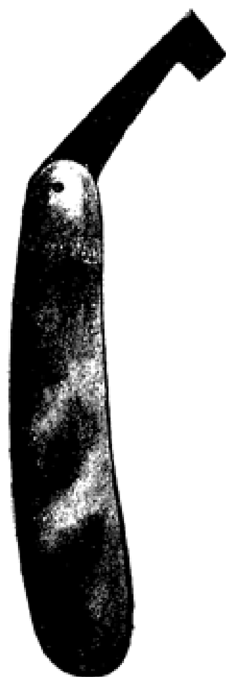


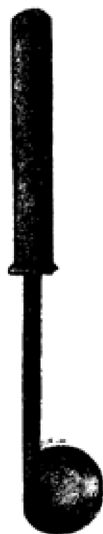
Sinhamukha Svastika
(Lion forcep)



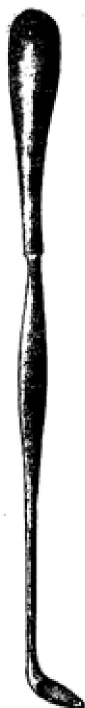
Tarkasmukha Svastika
(Hyena forcep)

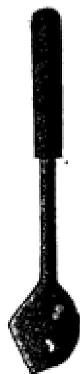
(After Thakore Saheb)



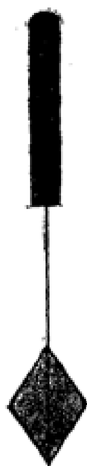


Kuthara (Axe)　　Kuthara (Axe)
(after Thakore Saheb)

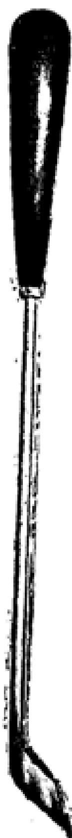




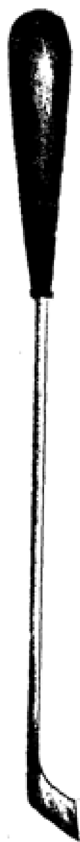
Sarpunkhmukha Sala
(Tooth elevator)



Danta Sanku
(after Thakore Saheb)



Danta Sanku
(Sushruta)
(Tooth Scalers)



Danta Sanku
(Vag Bhata)

Of course we will not agree with this with our present knowledge. In the opinion of Sushruta however learned a student may be in book-lore, he cannot be considered fit and competent for the practice of surgery, unless he has acquired the art of practical training. In the treatment of a sinus he has advised the removal of a carious tooth in the lower jaw; unless the tooth is completely removed and the affected part is cauterised, the sinus will never heal up. The operations in the mouths were performed when the patient had an empty stomach. The sick room was fumigated with the vapours of white mustard, bdellium, Nimiva leaves and resinous gums (Dhupa) of Shala trees and other things.

The use of anæsthetics was also known to Indian surgeons during the operations. They knew the anæsthetic called "Sammohini." Inhalations of the fumes of burning hemp was the anæsthetic used for dental operations at a remote antiquity. The operation was carried out painlessly. Charaka and Sushruta also advise us the use of wine to produce insensibility to pain.

प्राक्शस्त्रकर्मणश्चेष्टं भोजयेदातुरं भिषक् ।
मद्यपं पाययेन्मद्यं तीक्ष्णं योऽवेदनासहः ॥
न मूर्च्छत्यन्नसंयोगान्मत्तः शस्त्रं न बुध्यते ।
तस्मादवश्यं भोक्तव्यं रोगेषूक्तेषु कर्मणि ॥
प्राणोह्याभ्यन्तरो नृणां बाह्यप्राणगुणान्वितः ।
धारयत्यविरोधेन शरीरं पांचभौतिकम् ॥

In an accidental injury if the tooth of a young patient becomes loose, but not fractured, it should be plastered

with a cooling paste on the outside, after completely removing the blood that has coagulated at the root. It should be sprayed or washed with cold water and should be treated with drugs having Sandhaniya (adhesive) properties like honey, clarified butter and medicaments of Nyagrodhadi group. The patient should be strictly instructed to take liquid diet like milk with the help of a lotus stem thus giving the tooth the necessary rest. Thus there is a fair chance for the tooth to become firmly fixed again, the tooth of an old patient should be extracted.

In a case of the dislocation of the jaw bones (Hanu) they should be fomented, and duly set in the right position and bandaged in a manner of a Panchangi Vandha. Then Ghrita, boiled and prepared with (Kalka and decoction of) Madhur (Kakolyadi) and Vayu subduing (Chavyadi) groups should be used as errhines by the patient.

RHINO-PLASTY.

The exquisite grace of a surgeon's knife in the treatment of restoring slit noses, lips or accidental injuries was well known in those old days. This is one of the proudest achievements of Indian surgery. Even to day in Europe rhino-plasty is known as the Indian plastic (Indische methode). The origin of rhino-plasty dates back to a period of very early antiquity in the Vedic age. It is still being practised in our country. Noses were slit by the enemies as a punishment or in revenge. According to the religious concept of Manu it was a punishment for adultery. Prof. B. A. Saletore says "The Portuguese in India for example whose treatment of captured enemies

was notorious, also cut off noses and limbs of their victims." 1. The operation of restoring the noses was scientifically and skilfully performed.

Prof. Weber says "In surgery too Indians have attained a special proficiency, and in this department European surgeons might perhaps at the present day still learn something from them, as indeed they have already borrowed from them the operation of Rhino plasty". 2. Dr. Hirschberg of Berlin states "The whole plastic surgery in Europe has taken its new flight when these cunning devices of Indian workmen became known to us. The transplanting of sensible skin flaps is also an entirely Indian method." 3.

Sushruta says "First the leaf of a creeper, long and broad enough to fully cover the whole of the severed part should be gathered and a patch of living flesh, equal in dimension to the preceding leaf should be sliced off (from below upward) from the region of the cheek and after scarifying it with a knife, should be swiftly plastered to the severed nose. Then the cool headed surgeon should steadily tie it up with a bandage decent to look at and perfectly suited to the end for which it has been employed. (Sadhu Vandha). The doctor should make sure that the adhesion of the severed parts has been fully effected and then insert two small pipes into the nostrils to facilitate respiration and to prevent the adhering flesh from hanging down. After that adhering part should be dusted with powder of Pattanga, Yasti-Madhukam, and Rasanjana pulverised together and the nose should be enveloped in

Kapasa cotton and several times sprinkled over with refined oil of pure sesamum. Clarified butter should be given to the patient for drink and he should be anointed with oil and treated with purgatives after the complete digestion of the meals taken by him as advised (in medical books), Adhesions should be deemed complete after the incidental ulcers have been perfectly healed up, while the nose should be again scarified and bandaged in the case of a semi or partial adhesion. The adhering nose should be tied and elongated if it falls short of its previous length, or it should be surgically reduced to its natural size in case of the abnormal growth of the newly formed flesh.

The mode of bringing about the adhesion of severed lips is identical with what has been described in connection with a severed nose with the exception to the insertion of pipes. The doctor who is well conversant with these methods can alone be entrusted with medical treatment of a king."

An interesting and instructive picture of the operation of rhino-plasty was published in the Gentleman's Magazine of Calcutta October 1794, which has been reprinted in Prof. Castiglioni's book on the history of medicine.

HEMORRHAGE.

It is the general opinion of some scholars of surgery that the Ayurvedic doctors did not know the proper treatment of hemorrhage. But this is far from the truth. Sushruta has described four different types of treatment for arresting the bleeding after venesection.

(1) Sandhana control of the wound by application of astringent decoctions of chebulic Myrobalan and roots of the Panchvalkala trees (five barks). (2) Skandhana or thickening of the blood by application of cold. (3) Panchana or drying up the wound by ashes. (4) Dahana or cauterising the veins to make them shrink.

If the blood does not thicken by the application of cold, astringents should be applied. If this fails ashes should be used. By these three methods the doctor should endeavour to the best of his abilities to check the bleeding. But if these measures fail, then the cautery may be resorted to as the last absolute effective means. To stop bleeding from an artery, he advises the application of astringents and pressure with fingers. Vaghabhata also describes these methods for arresting hemorrhage and advises us that if ordinary means do not check the bleeding, the vessel must be opened at a point in its course beyond the bleeding area and the actual cautery be applied to it. Chakradatta also repeats these directions. Vaghabhata however mentions the sheep's gut among the accessory instruments, and its use for ligaturing the blood vessels has also been explained. Sushruta says that if in venesection, or in treating wounds excessive bleeding occurs, it should be stopped by proper means (Mukhopadhyaya) 4.

INSTRUMENTS.

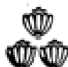
The surgical instruments have been divided in different orders. These instruments are named after the birds or beasts they resemble in form and figure, the instrument resembles the mouth of a particular animal or according

to the instructions of old and experienced surgeon or according to the directions laid down in Sastras (recognised medical books). They should also be constructed according to the exigencies of the case or after the shape and structure of other appliances used on similar occasions.

The appliances should be made neither too large nor too small and their mouths or edges should be made sharp and keen. They should be specially made with an eye to strength and steadiness and provided with convenient handles. Appliances of the Svastika type should be made to the measure of the appropriate finger length. Their mouth should be made to resemble those of lions, tigers, wolves, hyenas, bears, herons and other birds or beasts. The two blades or halves of Svastika should be welded together by means of a bolt like a Masura pulse in size, and the handles be turned inward in the shape of a mace or an Ankusa. Instruments of these types should be used for extractions.

A clever surgeon should use his judgement and decide about the nature of the surgical operation and the instruments required in varied circumstances. The instruments should not be too long or too short to grasp nor should they be loosely fitted. They should also be not soft boiled. The defective instruments should be rejected. The instruments that are fitted with handles of easy grip and which are made of good pure iron, well shaped, sharp, and set with edges that are not jagged and which end in well formed points or tops, should be deemed as the best of their kind.

Surgical instruments should be tempered with one of the three substances like an alkali, water, or oil, according to the requirements of the case. Further the instruments which are properly designed, well grounded, and fitted with an easy and convenient handle, which is so sharp in its edge as to cut a hair in two parts, should be used by the surgeon. The instruments which are made exactly according to the rules of the medical books should be used for operations. It is the duty of every clever surgeon to see that the instruments are made by an expert black-smith according to the instructions of the doctor and are constructed of the best iron. A surgeon who has mastered the technique of skilfully handling the surgical instruments becomes a very successful operator in practice.



Chapter VI.

INDIAN DENTAL ART AND LEGENDS.

The Hindus were conversant with the art of dental prosthesis. It has been stated in Elphinston's history of India that Jay Chandra Rathod, the king of Conouj whose dead body was recognised by artificial teeth when he was killed in a battle with Shahabudin in 1194 A. D. 1. Very illuminating and interesting information on the dental art of antiquity in India has been mentioned by Dr. N. N. Bery 2. which we shall read in the following lines.

"Prosthetic dentistry was known to the Indians ages before, it was practised in a solid block of ivory obtained from the sea horse, elephant's tusks and carved to represent the missing teeth, some of which we admit were exceptional works of art. Then again natural teeth were used taken from corpses or even living men and mounted on gold, silver, ivory or boxwood. Measurements were taken by means of a compass of these parts of the jaw for which artificial teeth were required. The teeth were carved in occlusion (from ivory) and then the two pieces separated by a saw. The gums were painted with pigment, and the fit was effected by carving and scooping out the marked places. Ingenious individuals fashioned rude teeth to supply deficiencies in their own mouths out of mother of pearl, quartz and sea shells. In using human teeth on artificial plates, they were cut off at the crowns, the canals cleaned out and enlarged to receive the pin which was riveted to the under side of the bone or gold plate. For gold plates, impressions were taken in wax and casts made. The lump

of wax was softened in front of the flame gradually and cautiously. The bite was the most difficult. Teeth were carved and fixed to tacks of copper or iron driven through the plate. Another method was to carve the teeth (when a few were missing) in one block and a double string was passed through the whole. The loop goes over a tooth on one side, and the loose ends were fastened to another on the opposite side. Tortoise shells were used in mechanical dentistry for plates. Its strength, cleanliness, durability and low specific gravity, its superiority over sea horse and ivory as the basis of artificial teeth was undoubted, and that when used in connection with mineral teeth its advantages were obvious. It was capable of receiving a high degree of polish.

Many were the formulae for the manufacture of dentures, every one had his own, a secret which was guarded with utmost jealousy.

The goldsmith's art is of such antiquity that it is impossible to put a date to the first use of thin strips of gold for plates, and for attaching loose teeth to the more firmly standing neighbouring ones. It was also done with gold and silk threads.

J. H. Badcock says "It is well known that old Indians filled up in a neat manner the gap left by a fallen tooth, with small plates of gold." It is related by Bontius, that the Indians who lose their teeth while young, replace them by others of gold. Carrier says "In parts of India where the idea is that the blacker the teeth, the more beautiful they are it was the custom to set off this beauty

by small plates of gold inserted between them. Mother of pearl was largely used for manufacturing false teeth".

Badcock says "The habit of tying loose teeth to sound ones is an ancient custom among Indians. One of most curious specimens of it was some years ago presented to the Medici Chirurgical Society of Edinburgh. It was taken from the mouth of an Indian queen and consisted of the whole of the lower jaw united by gold wire, which had been removed in one piece, the only point of attachment to the mouth being the apices of the roots of the wisdom tooth. The teeth of the upper jaw were united in a precisely similar way".

In Moghul times, that is, from the 14th to the 17th century great impetus was given to the arts of all descriptions, including the beautifying of the mouth, says Dr. Ahmed. "The Court Dentists preserved for the royalty the entire denture kept the same clean". It is in that period we find records of gold, jade, and diamond inlays being inserted in the mouth of the ladies of the royal families. Tooth picks of gold and silver and tongue scrapers of the same metal were in the height of fashion.

Various castes had their own signs of distinction. In some gold fillings on the labial surface of the upper central incisors were and are still inserted as a sort of caste mark. A peculiarity of Katras in Southern India was of hacking the front teeth into points until they closely resemble the teeth of a shark. This they were able to do by using fragments of stone or shell, or even fish bones with great adroitness, badgioning the gums with coca

during the process. The Santals or hill tribes have gold fillings in the front teeth for decoration.

J. D. Logan says "The Hindus knew the art of dentistry, for Belzoni and others found artificial teeth of sycamore wood in ancient sarcophagi the method of fixing being by attachment to the natural organs with ligatures of bands of cords, or gold and silver wire".

Dr. Johns of Darjeeling had two very interesting cases to mention to uphold the antiquity of Indian bridge work. On examining the teeth of Tibetian nobleman, he found two upper centrals and left first bicuspid replaced by beautifully carved ivory teeth out of elephant's tusk, one piece for the two centrals and another for the bicuspid. Both the pieces were drilled through the approximal surfaces and two pieces 22 karat gold wire inserted in each piece and cemented.

These gold clasps, the palatal ones being thicker than the labial, fitted around the adjoining teeth to keep them in position. He was able to take out for cleaning purposes. The teeth were carved by one of his carpenters and he had been very comfortable for several years.

The other case was of a Hindu lady who had two superior laterals extracted by the village goldsmith owing to abscesses. She being a high class orthodox Hindu, ivory of any kind could not be utilised, so the ingenious goldsmith had successfully made use of hard sea shells for facings. A neatly made piece of 22 karat gold plate attachment covering up the palatal surface of both centrals

extending from the gingival margin to the incisal edge and slightly over the approximal surfaces had been made. To the middle of this wire was soldered, which came over to the labial side as clasps. This held the appliance in the mouth. Two pieces of neatly shaped sea shell facings were drilled through the labial surface and riveted. The removable bridge used to fit in like a press button and firm in the region. The patient experienced great comfort with them.

" It was altogether a remarkable and magnificient piece of work for a humble goldsmith " he says " which I am sure will defy many modern prosthesis ".

Here are two typical cases of perfectly made removable bridges and they certainly establish that the Indian goldsmith is by far the most clever and ingenious craftsman in this art among the people of antiquity.

LEGENDS.

Various customs of a peculiar nature existed in ancient India. In the legends of Asoka, the first emperor of India (B. C. 272–232) there existed a peculiar tooth custom of attestation of a deed by the impression of the author's teeth. It is interesting to note this custom prevailing in England during Anglo–Saxon times. A curious folklore custom in connection with the disposal of the teeth, says Edgar Thomas, existed at the Arohday Festival, which was held every year near Calcutta in February. Any teeth which were carefully preserved were solemnly flung into the Ganges river. The people believed this practice would ensure immunity from toothache and gum boils in the next world.

The earliest annals directly concerned with counteracting toothache and kindered troubles of the gum and the mouth on record naturally have an oriental origin. Among the different Indian races the tooth of a crocodile, in many instances beautifully embellished in silver or gold mount, strung around the neck, was considered a powerful antidote to toothache. Genuine amber necklaces, the beads were generally facetted, were another favourable help in teething, it being sufficient to have the necklace round the child's throat during second dentition, assiting in easy breeding and cutting of the teeth. A well known proverb in ancient India was " He who does not masticate well, is an enemy of his own life ".

" Mention is made about the " Sacred tooth of Buddha " existing in Ceylon, a relic probably reverenced by a large number of people more than any other relic in the world. This tooth is the left canine, a piece of discoloured ivory two inches long, much too long for a human tooth, which is preserved in nine successive bell shaped gold jewel cases in the temple of the Kandyan Kings ".



Chapter VII.

DECLINE AND CONCLUSION.

It would be interesting to know the ultimate fate of this ancient science. After dentistry had reached the pinnacle of glory, it gradually began to sink and dwindle away, with the progress of Buddhism, which later on passed into modern Hinduism, and with teachings of Gautama Buddha forbidding human dissections and touching of dead flesh, morbid matter, blood etc., the Brahmins, the great pioneers and research scholars in this science withdrew from the medical profession. Those famous hospitals and dispensaries began to disappear and with the passing away of the talented medicos dentistry began to decline. The world famous University of Taksha Shila (Taxila) was destroyed by the "Hun" tribes between 450–500 A. D. The law of Manu forbade the consumption of food obtained from the hands of a doctor and especially a surgeon. The interference of the priests in medical science was detrimental to its further progress. They began to cure diseases by spells, charms, incantations, and drugs without any scientific knowledge. The temples were used as consulting rooms for the treatment of the body and the soul.

Then came the sovereignty of the Mahomedans from 1001 to 1707 A. D. The Nalanda University was burnt down and destroyed in 1203 A. D. by Bakhtyar Khilji. The Islamic invasion of India brought in a foreign school of medicine and its physicians were known as "Hakims". Then came the Peshwas. Later on the English appeared

with a preconceived notion of the superiority of their civilisation and imbued with the belief that Indian medicine contained nothing worth perusal and study. Their rule lasted over 170 years and by their influence as a ruling race, they gave a great impetus to western science whereby Indian medicine was depreciated and ignored, creating in us an inferiority complex; slavish mentality and blind beliefs that every thing European was far superior to the Indian. Dentistry also received a fatal blow, and fell in the hands of unskilled practitioners, whose knowledge was entirely empirical. As in other countries of the world, it produced the barber surgeons of India and eventually sank into oblivion.

It was a mighty fall. The science which had attained its unique glory in the days of Sushruta and Charaka, is now considered a quackery. The humoral theory of Vayu, Pitta and Kapha, is the fundamental basis of all diseases even dental and oral, when their equilibrium in proper measure is disturbed. The theory of these three "Doshas" is too intricate for us to understand, but those who are interested in the subject may be referred to the volumes of Ayurveda. Those who have patiently examined this system with a clear mind and a spirit of fairness must have been convinced that it is far from quackery. Prof. Max Neuberger of Vienna says "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them and owing to its wealth of knowledge, depth of speculation and systematic constructions takes an outstanding position in the history of oriental medicine". 1.

F. H. Garrison the medical historian of U. S. A. remarks, "Anatomy and physiology like some aspects of chemistry, were by-products of Hindu medicine. As far back as the 6th century B. C. Hindu physicians described ligaments, sutures, lymphatics, nerves, plexus, fascia, adipose, and vascular tissues, mucous and synovial membranes, and many more muscles, than any modern cadaver is able to show". 2.

Will Durant observes "Anticipating Weissman by 2400 years, Atrey held that the parental seed is independent of the parent's body, and contains in itself in miniature, the whole parental organism. 3. Foetal development was described with considerable accuracy, it was noted that the sex of the foetus remains for a time undetermined, and it was claimed that in some cases the sex of the embryo could be influenced by food or drugs". 4. Bhav Misra (1550 A. D.) in his voluminous work mentioned (a hundred years befare Harvey) the circulation of blood. 5.

At the first Indian medical Congress in 1894 Brig-Surg. Lieut. Col. T. H. Hendley in his paper on the "Indian system of medicine" remarks "The subject is extremely interesting, and our Indian members may add much to our knowledge by translating the best works".

G. N. Mukhopadhyaya says "The Hindus understood the action of drugs, and no less than 5oo classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases and their remedial agents have been collected from the vegetable, animal, and mineral kingdoms. There are 41 different forms in which

the medicaments may be exhibited to the pat'ent. We had a complete nomenclature of the diseases which are described minutely as regards their etiology, symptomatology, diagnosis, pathology, prognosis and treatment. 6. Hoernle states " Its extent and accuracy are surprising, when we allow for their early age probably 600 B. C., and their peculiar methods of definition ". 7.

In the time of Alexander says Garrison " Hindu physicians and surgeons enjoyed a well deserved reputation for superior knowledge and skill and even Aristotle is believed by some students to have been indebted to them. 8. Havell has stated, " The great Caliph Harun-al-Rashid accepted the pre-eminence of Indian medicine and scholarship, and imported Hindu physicians to organize hospitals and medical schools in Baghdad ". 9. Lajpat Rai observes " Lord Ampthill concludes that medieval and modern Europe owes its system of medicine directly to the Arabs, and through them to India ". 10.

The Ayurvedic system of medicine is not only to be viewed from its antiquarian historical point of view, for it is a living science, and even to-day millions of patients in our country are being benefited by its treatment. The ancient science which stood the tests for several centuries and which has survived the shocks of repeated incursions of the rival systems cannot be brushed aside as a mere quackery.

Solomon the wise has said " There is nothing new under the sun". With the back ground of cultural heritage, learning and philosophy worthy of our ancient great land,

our present day advanced dental colleges may be considered the reincarnation of our ancient science on more scientific and progressive lines. With our rapidly advancing modern knowledge, we may find it difficult to accept all things stated by the Ayurveda, but we shall certainly be wiser by perusing it and accepting its great and good features, which have served in alleviating suffering of humanity in India for many long centuries.

> "Brighter than the sun-rise glory
> Or the sun-set's golden hue
> Are the pages written in Ayurvedic story
> By the patriots talented and true".



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3 Charaka Samhita Vol 2 p. 84 (Shree Gulabkunvarba Ayurvedic Society, Jamnagar).
4 Indian Dental Journal No. 3 1929 (Dentistry in Ancient India by N. N. Bery)
5 Indian Dental Journal No. 3 1929 (Dentistry in Ancient India by N. N. Bery)
6 I'tsing Records of the Buddhistic Religion p. 33
7 Indian Dental Jurnal No. 3 1929 (Dentistry in Ancient India by N. N. Bery)
8 Indian Dental Journal No. 3 1929 (Dentistry in Ancient India by N. N. Bery)
9 Indian Dental Journal No. 3 1929 (Dentistry in Ancient India by N. N. Bery)
10 Sushruta Samhita by K. L. Bhishagratna chapter 16, Nidana Sthana Chapter 22 Chikitsa Sthana.

Chapter V

1 The art of cutting noses, Journal of the University of Bombay January 1946.
2 History of Indian literature by Weber. p. 269
3 Surgical Instruments of the Hindus by G. N. Mukhopadhyaya Vol 1 p. 361
4 Surgical Instruments of the Hindus by G. N. Mukhopadhyaya Vol 1 p. 223

Chapter VI

1 History of India by Elphinstone p. 356
2 Indian Dental Journal No. 3 1931 (Dentistry in Ancient India by N. N. Bery)

Chapter VII

1 History of Medicine Vol 1 by Max Neuberger p. 437 (Translation by Playfair)
2 History of Medicine by F. H. Garrison Phila, 1929 p. 71
3 Hindu Achievements in Exact Science by B. K. Sarkar 1918 New York p. 63
4 Hindu Achievements in Exact Science by B. K. Sarkar New York 1918 p. 65
5 The Antiquity of Hindu Medicine and Civilisation by D. C. Multhu London 1930 p. 39
6 Surgical Instruments of the Hindus by. G. N. Mukhopadhyaya Vol 1 p. 334
7 Hoernle's Osteology preface.
8 History of Medicine by F. H. Garrison p. 72
9 History of Aryan Rule in India by E. B. Havell p. 255
10 England's Debt to India, New York 1917 by Lajpat Rai p. 287



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